abco

PRODUCT DIRECTORY
Ed. 2013

INDEX

ALPHABETICAL INDEX

LIST BY CODE

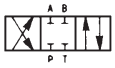
abco

DIRECTIONAL CONTROL VALVES

ISO 02 HYDRAULIC VALVES type HD2-ES
DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- **ISO 02** interface
- Oil immersed solenoids for AC and DC current
- Emergency pin for manual override
- Maximum flow rate: 30 l/min
- Maximum pressure (port P-A-B): 320 bar
- Maximum pressure (port T): 160 bar
- 100% duty cycle
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
- Recommended viscosity range: 10 to 60cSt

SPOOL TYPE **

0	
1	
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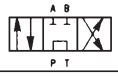
4	

DRIVE ARRANGEMENT

C	
N	
LL	
ML	

ORDERING CODE

HD2 – ES – 1 C – *

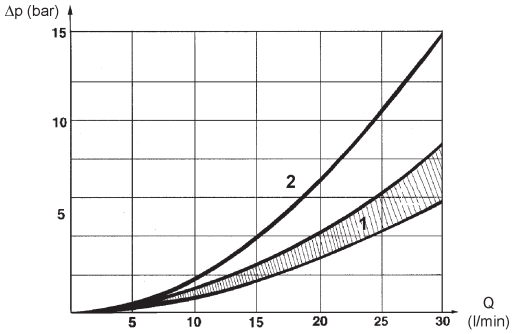
HD2	ISO 02 4-way directional control valve
ES	Electrically controlled
1	Spool type **(see table)**
C	Drive arrangement **(see table)**
*	b: only for versions LL, ML, LM solenoid "b"

B02 – *

B02	Coil for HD2-ES valves (plugs according to ISO 4400) Admissible voltage variation: -10% +5%
-012C	12V DC – 2,4A
-024C	24V DC – 1,2A
-115A	115V 50/60Hz AC – 0,30A
-230A	230V 50/60Hz AC – 0.15A

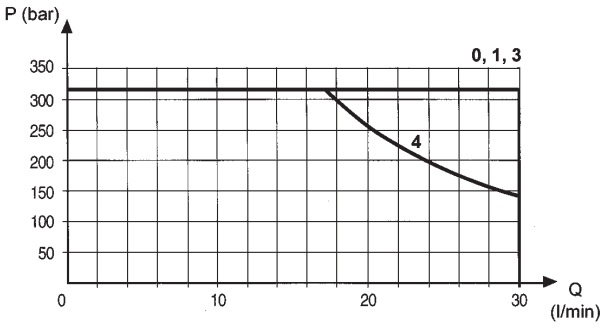
TYPICAL DIAGRAMS

Typical **Δp-Q** curves for valves **HD2-ES** in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T



1) All spools P→A,B and A,B→T. Spool 4 P→T. **2)** Spool 4 P→A,B and A,B→T

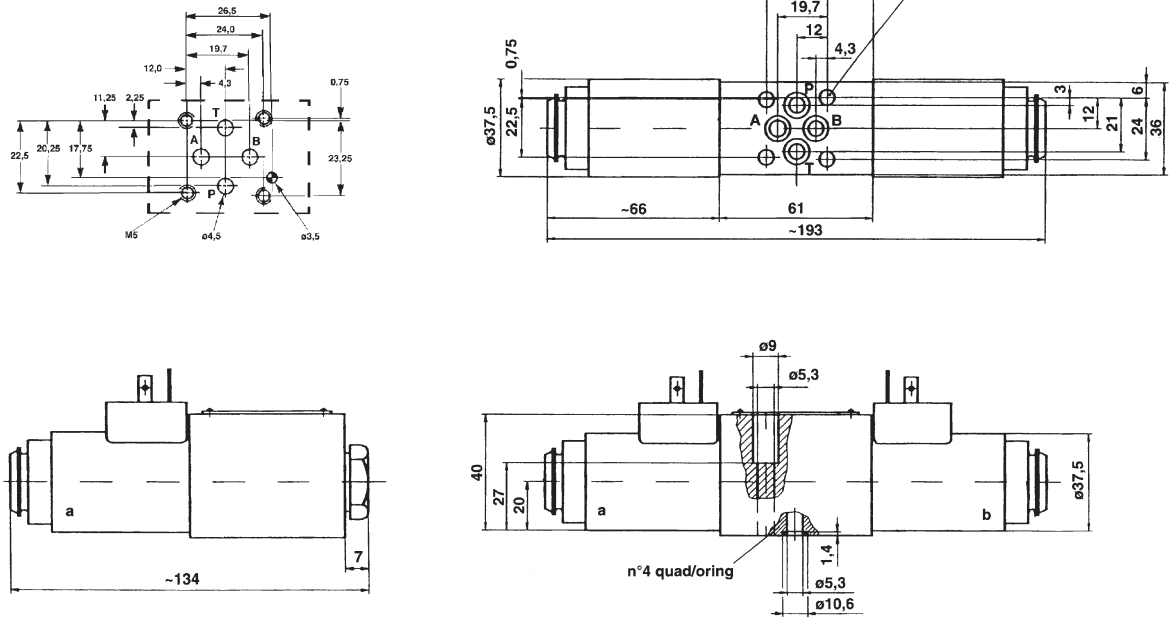
Typical **p-Q** curves of operating limits for maximum hydraulic power transferred by valves **HD2-ES**



0) Spool type 0 **1)** Spool type 1 **3)** Spool type 3 **4)** Spool type 4

OVERALL DIMENSIONS

ISO 02 interface

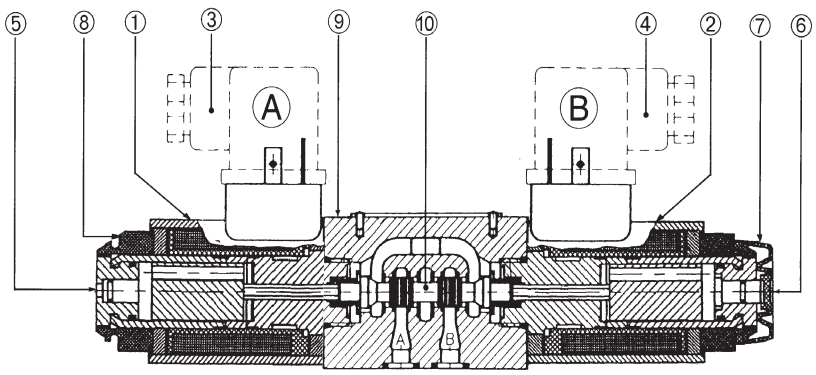


Fixing bolts: n.4 M5 x 35 (not included) – Tightening torque 8Nm
Valve mass: 0,90 kg (with 1 coil) – 1,30 kg (with 2 coils)

Subject to technical and dimensional changes without notice

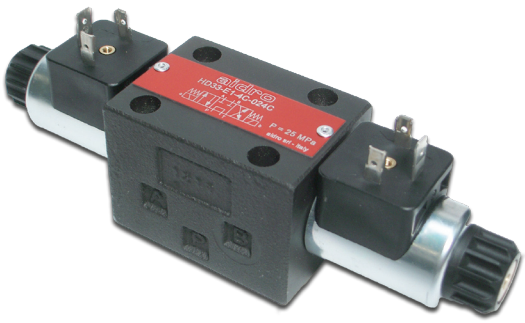
TYPICAL SECTION

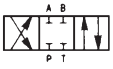
1-2	Solenoid	7	Protection muff (on request)
3-4	ISO 4400 plugs (not included)	8	Ring nut
5	Emergency pin	9	Body
6	Extended emergency pin (on request)	10	Spool



ISO 03 HYDRAULIC VALVES type HD33-EF
DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- **ISO 03** interface, light execution
- Oil immersed solenoids for DC current
- Emergency pin for manual override
- Maximum flow rate: 40 l/min
- Maximum pressure (port P-A-B): 250 bar
- Maximum pressure (port T): 160 bar
- 100% duty cycle
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt



SPOOL TYPE**	
0	
1	
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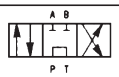
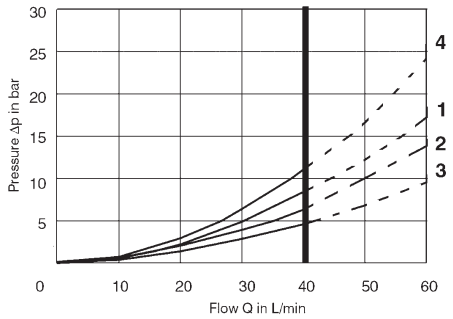
4	

DRIVE ARRANGEMENT	
C	
LL	
ML	

ORDERING CODE	
HD33 – EF – 3 C – *	
HD33	ISO 03 4-way directional control valve
EF	Electrically controlled
3	Spool type **(see table)**
C	Drive arrangement **(see table)**
*	b: only for versions LL, ML, LM solenoid "b"
B01 – *	
B01	Coil for HD33-EF valves (plugs according to ISO 4400) Admissible voltage variation: -10% +5%
012C	12V DC – 1,83A
024C	24V DC – 0,92A

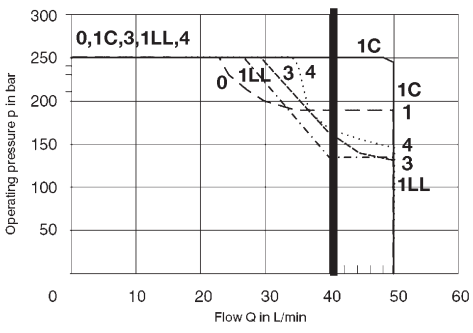
TYPICAL DIAGRAMS

Typical **Δp-Q** curves for valves HD33-EF in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T



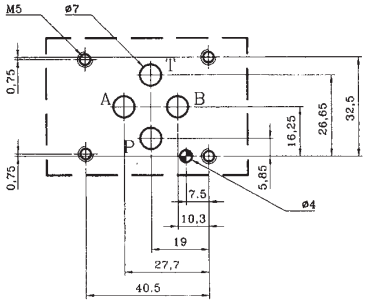
3) Spool 1LL P→A,B and spool 0 A,B→T **2)** Spools 0,1,3 P→A,B and spool 1 A,B→T
4) Spool 4 P→A,B and A,B→T

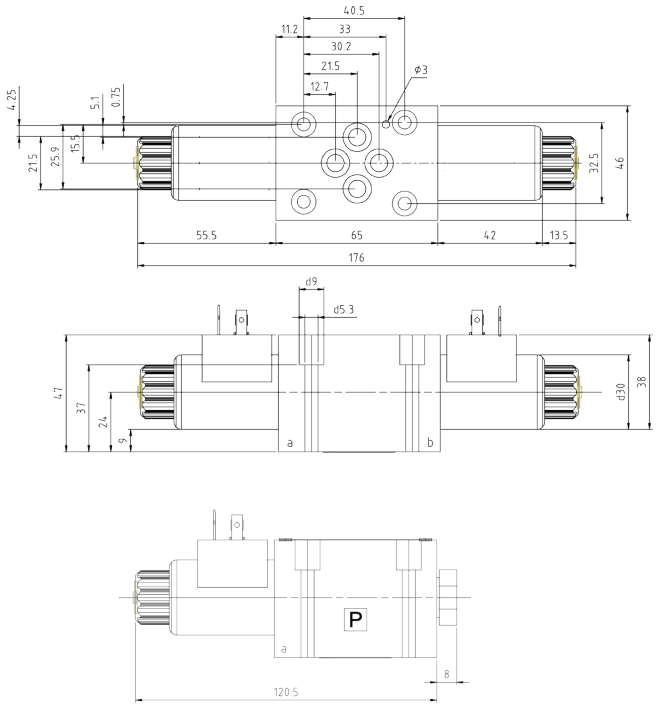
Typical **p-Q** curves of operating limits for maximum hydraulic power transferred by valves HD33-EF



Input voltage 5% less than nominal rate

ISO 03 Interface

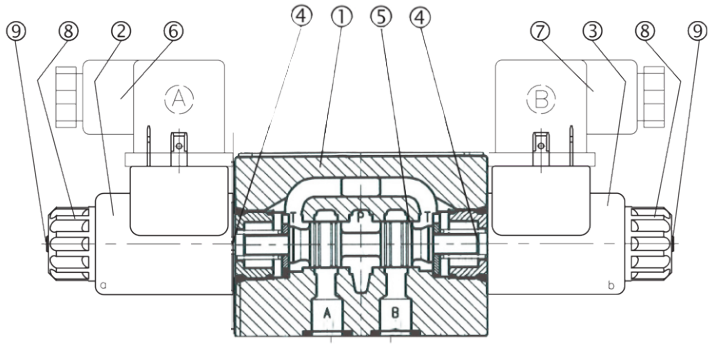




Fixing bolts: n.4 M5 x 45 (not included) – Tightening torque 8Nm
Valve mass: 1,25kg (with 1 coil) – 1,10 kg (with 2 coils)

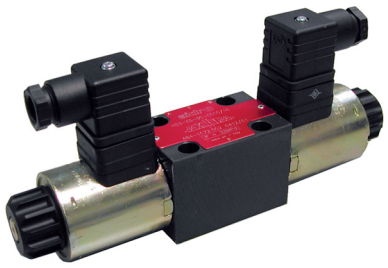
Subject to technical and dimensional changes without notice

1	Body	6-7	ISO 4400 plugs (not included)
2-3	Coils	8	Ring nut
4	Spring	9	Emergency pin
5	Spool		

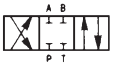


ISO 03 HYDRAULIC VALVES type HD3-ES/10
DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- **ISO 03** interface
- Oil immersed solenoids for AC and DC current
- Emergency pin for manual override
- Maximum flow rate: **80** l/min
- Maximum pressure (port P-A-B): **350** bar
- Maximum pressure (port T): 160 bar
- 100% duty cycle
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
- Recommended viscosity range: 10 to 60cSt



SPOOL TYPE **

0	
1	
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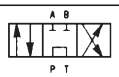
4	

DRIVE ARRANGEMENT

C	
N	
LL	
ML	

ORDERING CODE

HD3 – ES – 4 C – *

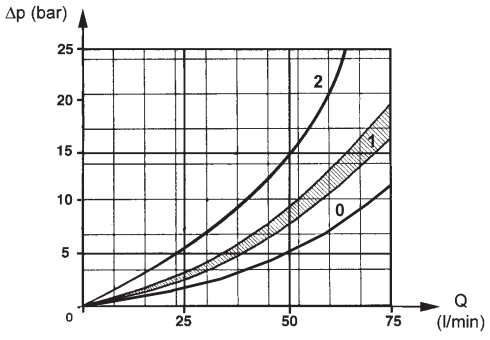
HD3	ISO 03 4-way directional control valve
ES	Electrically controlled
4	Spool type **(see table)**
C	Drive arrangement **(see table)**
*	b: only for versions LL, ML, LM solenoid "b"

B03 – *

B03	Coil for HD3-ES valves (plugs according to ISO 4400) Admissible voltage variation: -10% +5%
012C	12V DC – 2,8A
024C	24V DC – 1,4A
-115A	115V 50/60Hz AC – 0,35A
-230A	230V 50/60Hz AC – 0.17A

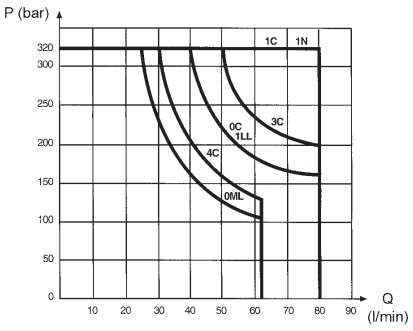
TYPICAL DIAGRAMS

Typical **Δp-Q** curves for valves **HD3-ES** in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T



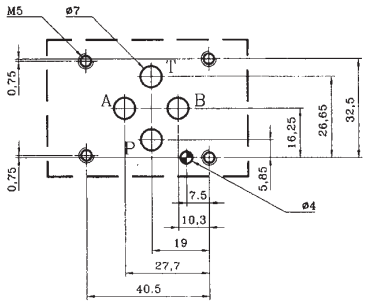
0) Spool 0 P→A,B and A,B→T **1)** All spools P→A,B and A,B→T. Spool 4 P→T.
2) Spool 4 P→A,B and A,B→T

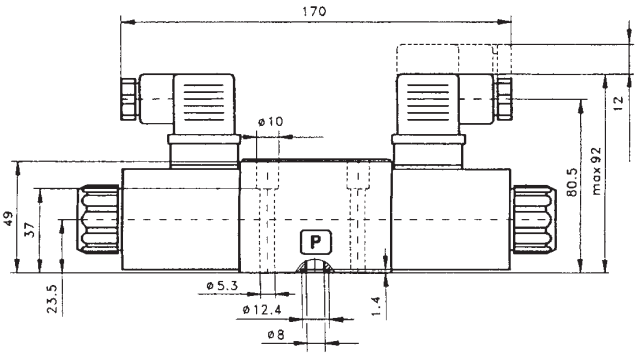
Typical **p-Q** curves of operating limits for maximum hydraulic power transferred by valves **HD3-ES**

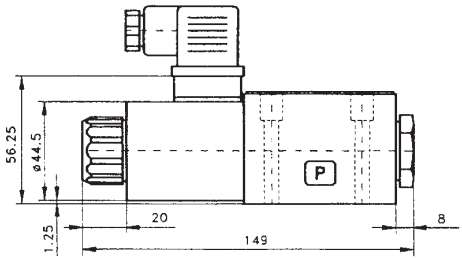


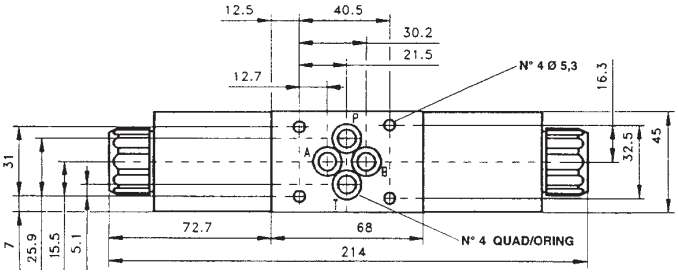
Input voltage 5% less than nominal rate

ISO 03 Interface





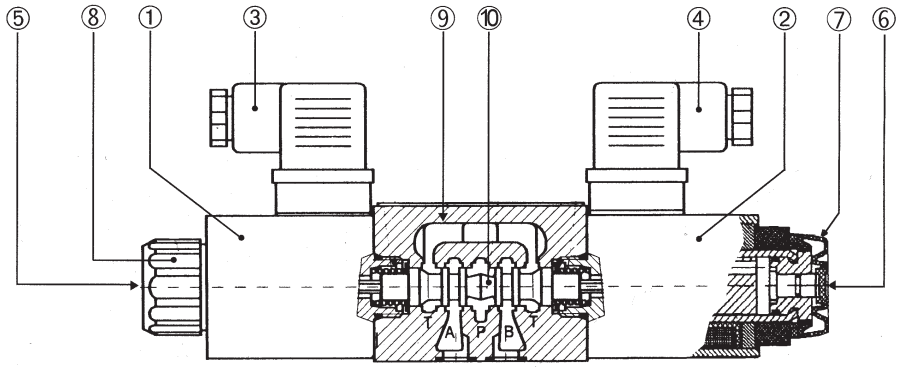




Fixing bolts: n.4 M5 x 45 (not included) – Tightening torque 8Nm
Valve mass: 1,60 kg (with 1 coil) – 2,10 kg (with 2 coils)

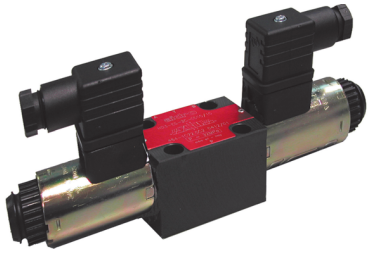
Subject to technical and dimensional changes without notice

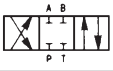
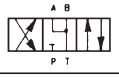
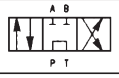
1-2	Solenoid	7	Protection muff (on request)
3-4	ISO 4400 plugs (not included)	8	Ring nut
5	Emergency pin	9	Body
6	Extended emergency pin (on request)	10	Spool



ISO 03 HYDRAULIC VALVES type HD3-ES/20
DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- **ISO 03** interface, light execution (solenoids ISO 02)
- Oil immersed solenoids for AC and DC current
- Emergency pin for manual override
- Maximum flow rate: 60 l/min
- Maximum pressure (port P-A-B): 320 bar
- Maximum pressure (port T): 160 bar
- 100% duty cycle
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt



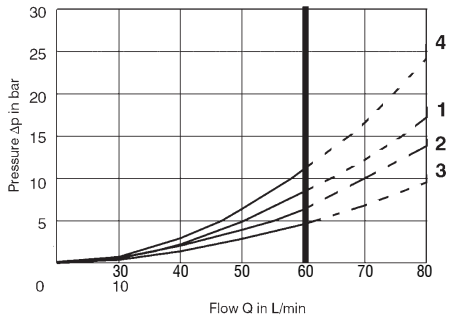
SPOOL TYPE**	
0	
1	
3	
4	

DRIVE ARRANGEMENT	
C	
LL	
ML	

ORDERING CODE	
HD3 – ES – 3 C – * / 20	
HD3	ISO 03 4-way directional control valve
ES	Electrically controlled, solenoid ISO 02
3	Spool type **(see table)**
C	Drive arrangement **(see table)**
*	b: only for versions LL, ML, LM solenoid "b"
B02 – *	
B02	Coil for HD3-E2 valves (plugs according to ISO 4400) Admissible voltage variation: -10% +5%
012C	12V DC – 2,4A
024C	24V DC – 1,2A
-115A	115V 50/60Hz AC – 0,30A
-230A	230V 50/60Hz AC – 0.15A

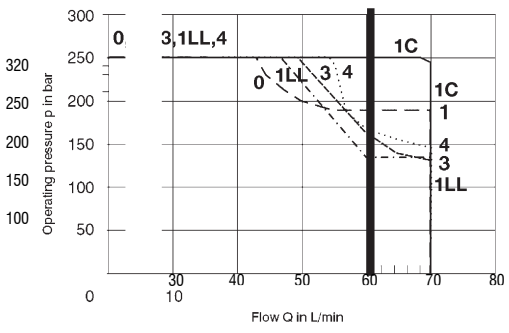
TYPICAL DIAGRAMS

Typical **Δp-Q** curves for valves **HD3-ES/20** in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T



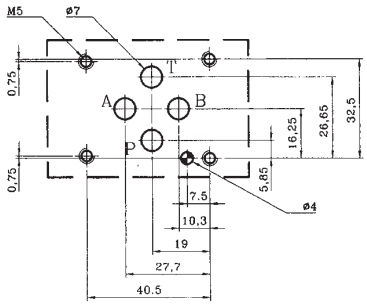
3) Spool 1LL P→A,B and spool 0 A,B→T **2)** Spools 0,1,3 P→A,B and spool 1 A,B→T
4) Spool 4 P→A,B and A,B→T

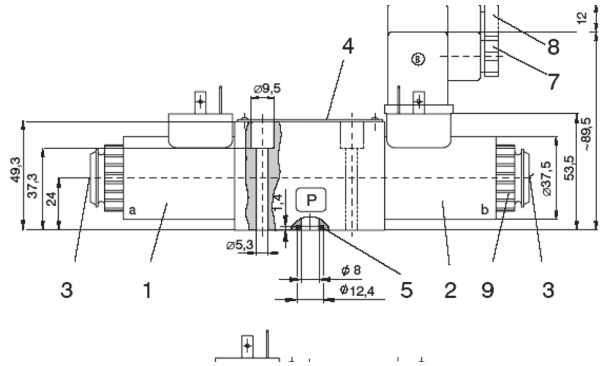
Typical **p-Q** curves of operating limits for maximum hydraulic power transferred by valves **HD3-ES/20**

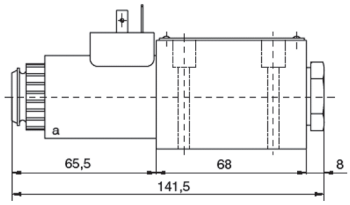


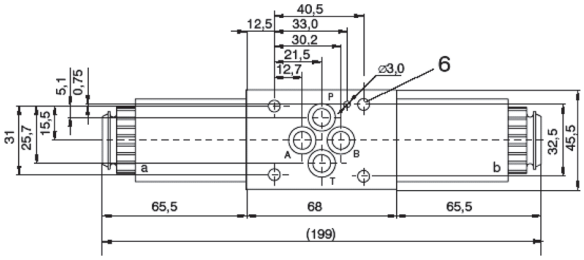
Input voltage 5% less than nominal rate

ISO 03 Interface





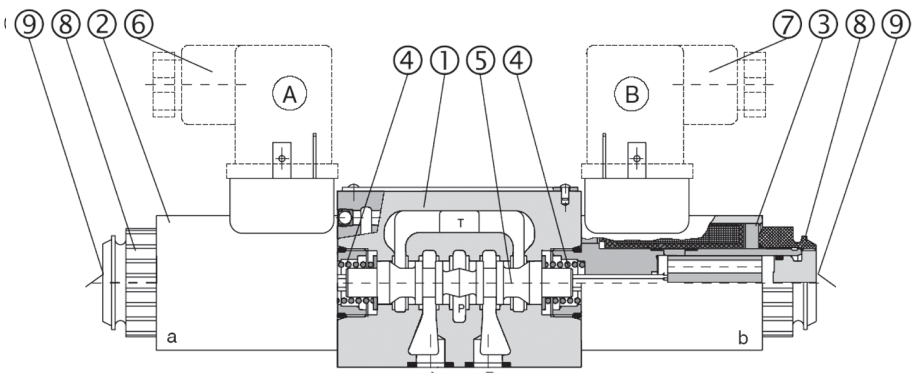




Fixing bolts: n.4 M5 x 45 (not included) – Tightening torque 8Nm
Valve mass: 1,40 kg (with 1 coil) – 1,60 kg (with 2 coils)

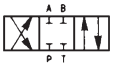
Subject to technical and dimensional changes without notice

1	Body	6-7	ISO 4400 plugs (not included)
2-3	Coils	8	Ring nut
4	Spring	9	Emergency pin
5	Spool		



ISO 05 HYDRAULIC VALVES type HD5-ES (drawing 20)
DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- **ISO 05** interface, **new generation** compact body
- Oil immersed solenoids for AC and DC current
- Emergency pin for manual override
- Maximum flow rate: 140 l/min
- Maximum pressure (port P-A-B): 350 bar
- Maximum pressure (port T): 210 bar
- 100% duty cycle
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
- Recommended viscosity range: 10 to 60cSt

SPOOL TYPE **	
0	
1	
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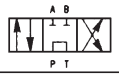
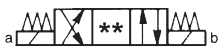
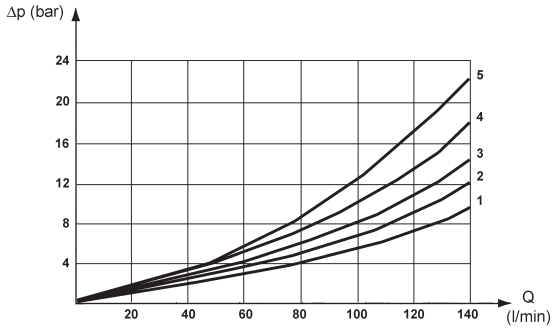
4	

DRIVE ARRANGEMENT	
C	
N	
LL	
ML	

ORDERING CODE	
HD5 – ES – 1 LL – */20	
HD5	ISO 05 4-way directional control valve
ES	Electrically controlled
1	Spool type **(see table)**
LL	Drive arrangement **(see table)**
*	b: only for versions LL, ML, LM solenoid "b"
20	Drawing
B05 – *	
B05	Coil for HD5-ES valves (plugs according to ISO 4400) Admissible voltage variation: -10% +5%
-012C	12V DC – 3,2A
-024C	24V DC – 1,8A
-115A	115V 50/60Hz AC – 0,40A
-230A	230V 50/60Hz AC – 0.21A

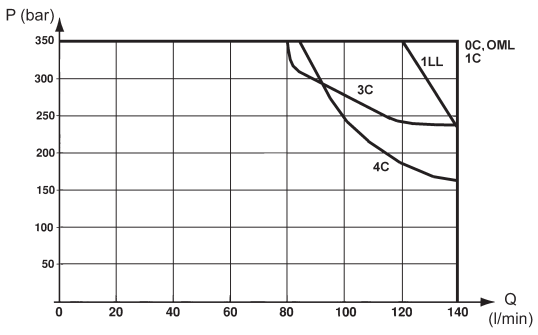
TYPICAL DIAGRAMS

Typical **Δp-Q** curves for valves **HD5-ES-***/20 in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T



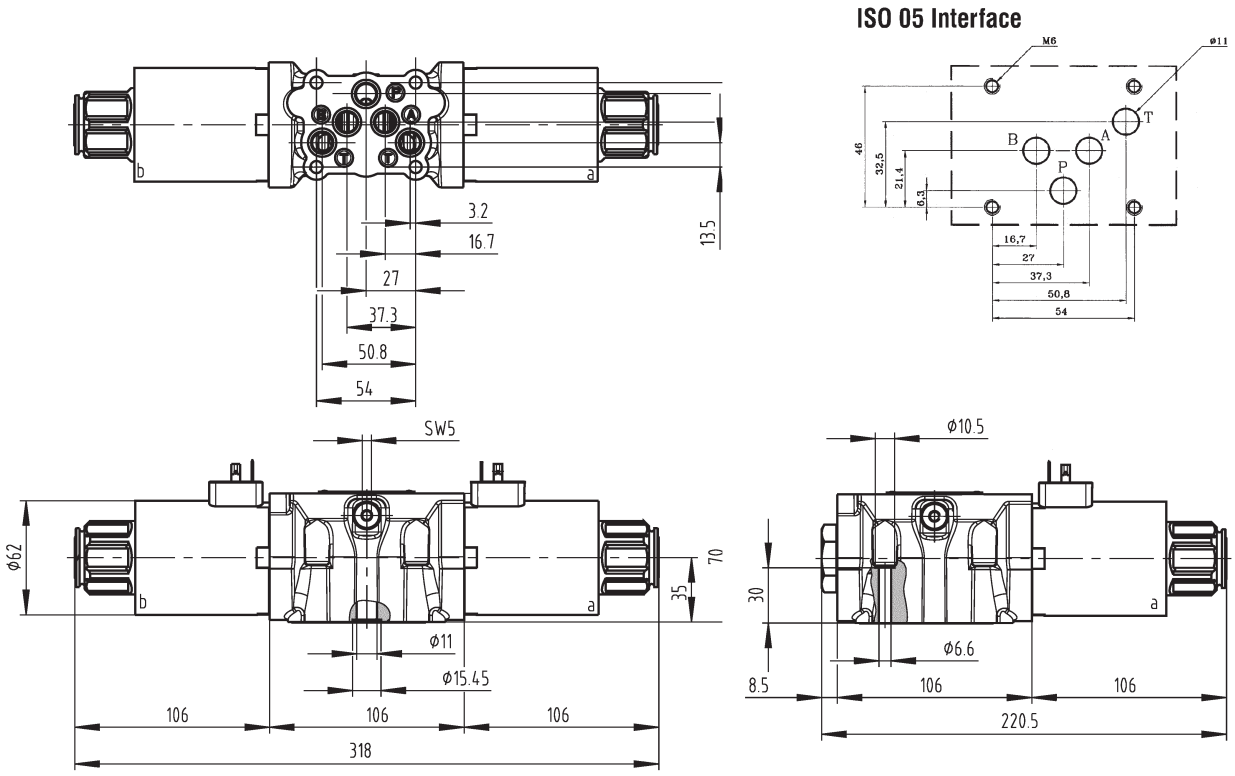
1) All spools P→A,B. Spool 4 P→T. **2)** All spools A,B→T
3) Spool 4 P→B **4)** Spool 4 P→A, A→T **5)** Spool 4 B→T

Typical **p-Q** curves of operating limits for maximum hydraulic power transferred by valves **HD5-ES-*/20**



Input voltage 5% less than nominal rate

OVERALL DIMENSIONS

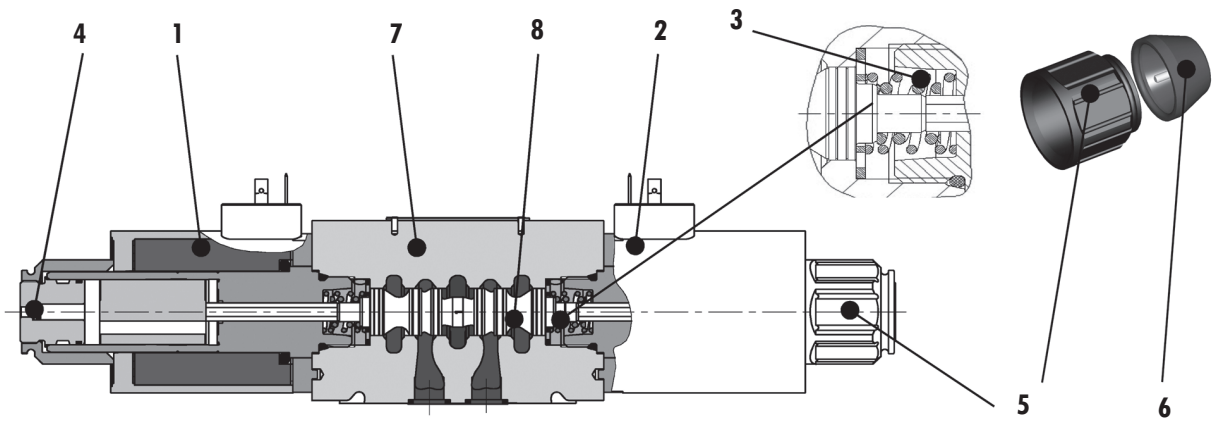


Fixing bolts: n.4 M6 x 40 (not included) – Tightening torque 14Nm
Valve mass: 3,9 kg (with 1 coil) – 5, 4 kg (with 2 coils)

Subject to technical and dimensional changes without notice

TYPICAL SECTION

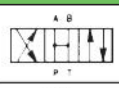
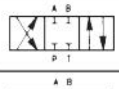
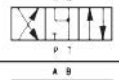
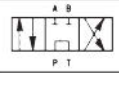
1-2	Solenoid	6	Emergency manual override (on request)
3	Double spring configuration	7	Body
4	Emergency pin	8	Spool
5	Coil retaining nut		



ISO 05 HYDRAULIC VALVES type HD5-ED
DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- **ISO 05** interface, light execution (solenoids ISO 03)
- Oil immersed solenoids for AC and DC current
- Emergency pin for manual override
- Maximum flow rate: 100 l/min
- Maximum pressure (port P-A-B): 320 bar
- Maximum pressure (port T): 210 bar
- 100% duty cycle
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
- Recommended viscosity range: 10 to 60cSt

SPOOL TYPE **

0	
1	
3	
4	

DRIVE ARRANGEMENT

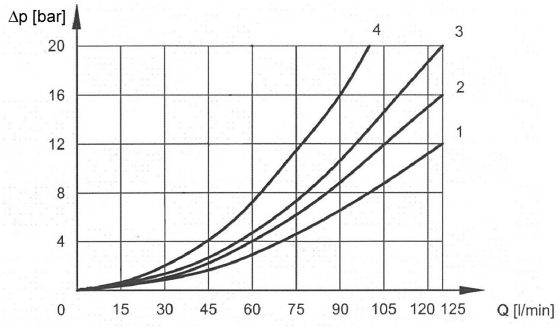
C	
LL	
ML	

ORDERING CODE

HD5 – ED – 3C – */10	
HD5	ISO 05 4-way directional control valve
ED	Electrically controlled, solenoids ISO 03
3	Spool type **(see table)**
C	Drive arrangement **(see table)**
*	b: only for versions LL, ML, LM solenoid “b”
10	Drawing
B03 – *	
B03	Coil for HD5-ED valves (plugs according to ISO 4400) Admissible voltage variation: -10% +10%
-012C	12V DC – 2,8A
-024C	24V DC – 1,4A
-115A	115V 50/60Hz AC – 0,35A
-230A	230V 50/60Hz AC – 0,17A

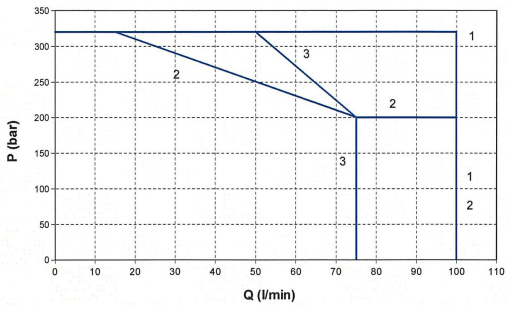
TYPICAL DIAGRAMS

Typical **Δp-Q** curves for valves **HD5-ED-***/10 in standard configuration, with mineral oil at 36cSt and 50°C for flow P=>A,B A,B=>T and P=>T



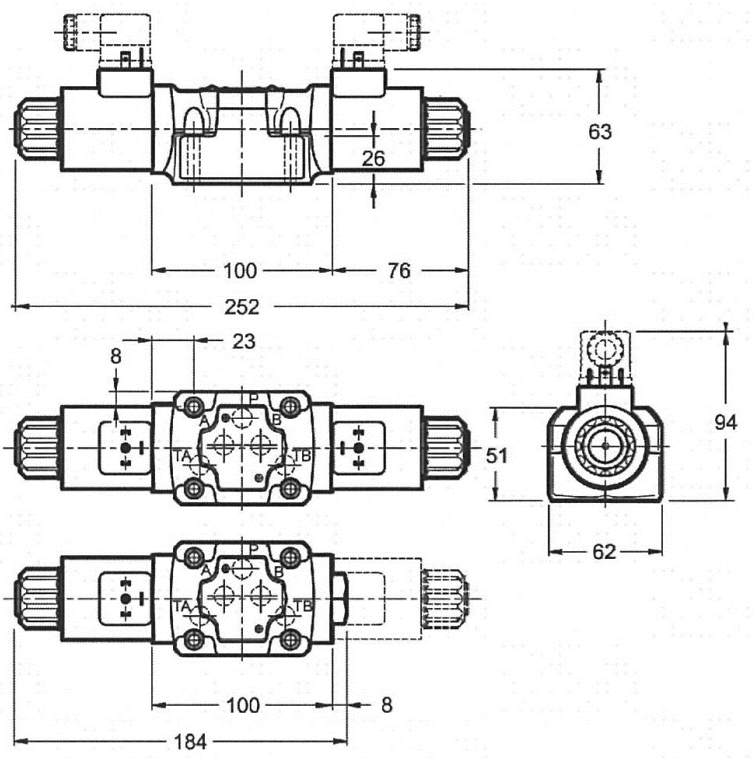
1) Spools **0C**,**1C**,**3C** P=>A,B Spool **4C** P=>T **2)** Spool **1C** A,B=>T - Spool **1LL** P=>A,B
3) Spool **1LL** A,B=>T **4)** Spool **4C** P=>A,B and A,B=>T

Typical **p-Q** curves of operating limits for maximum hydraulic power transferred by valves **HD5-ED-*/10**

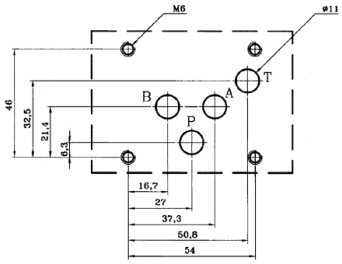


1) Spools **0C**,**1C**,**1LL**,**1ML** **2)** Spools **3C**,**3ML** **3)** Spools **4C**,**4ML**
Input voltage 5% less than nominal rate

OVERALL DIMENSIONS



ISO 05 Interface



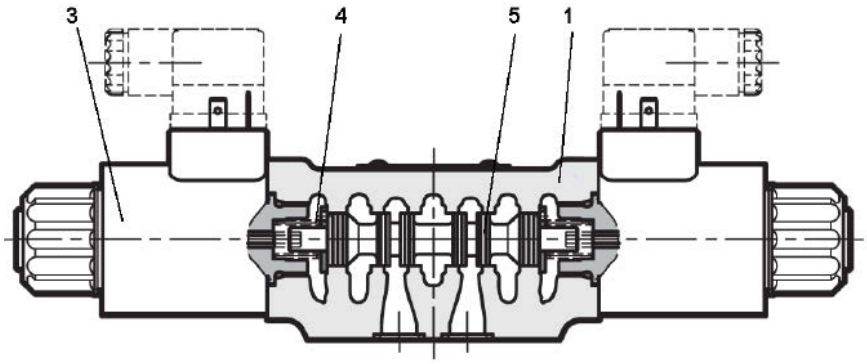
dimensions in mm

Fixing bolts: n.4 M6 x 35 (not included) – Tightening torque 12Nm
Valve mass: 2,4 kg (with 1 coil) – 3,0 kg (with 2 coils)

Subject to technical and dimensional changes without notice

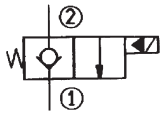
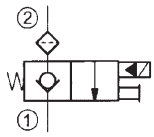
TYPICAL SECTION

1	Body	4	Spring
3	Solenoid	5	Spool



HYDRAULIC SCREW-IN VALVES type EVC.34/EVSC.34
N.C. 1-DIR. FLOW – SOLENOID OPERATED

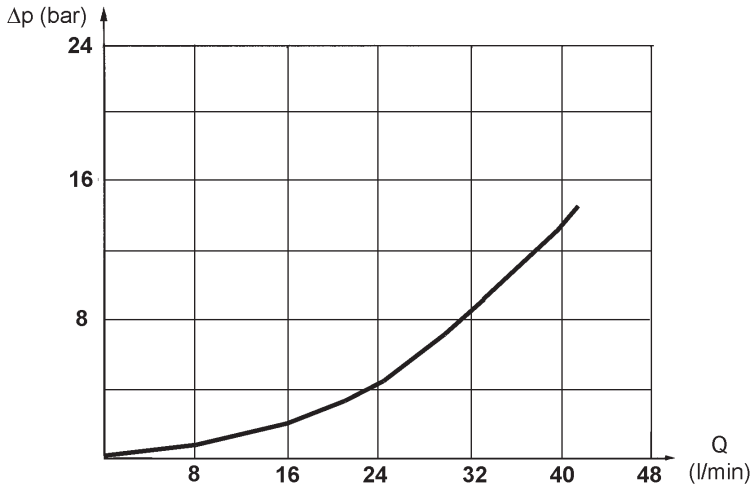
- Suitable for standard cavity **3/4" 16 UNF**
- **2-way** solenoid operated poppet valves
- Normally closed, one direction flow
- Maximum operating pressure: 250 bar
- Nominal flow rate: 32 l/min
- Maximum flow rate: 40 l/min
- 100% duty cycle
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,32 kg (coil included)

SYMBOL		ORDERING CODE
	EVC	**EVC.34.03** 2-way solenoid **operated** poppet valve, cavity 3/4" – 16 UNF
	EVSC	**EVSC.34.02** 2-way solenoid operated valve, cavity 3/4" – 16 UNF with filter and manual override by screw

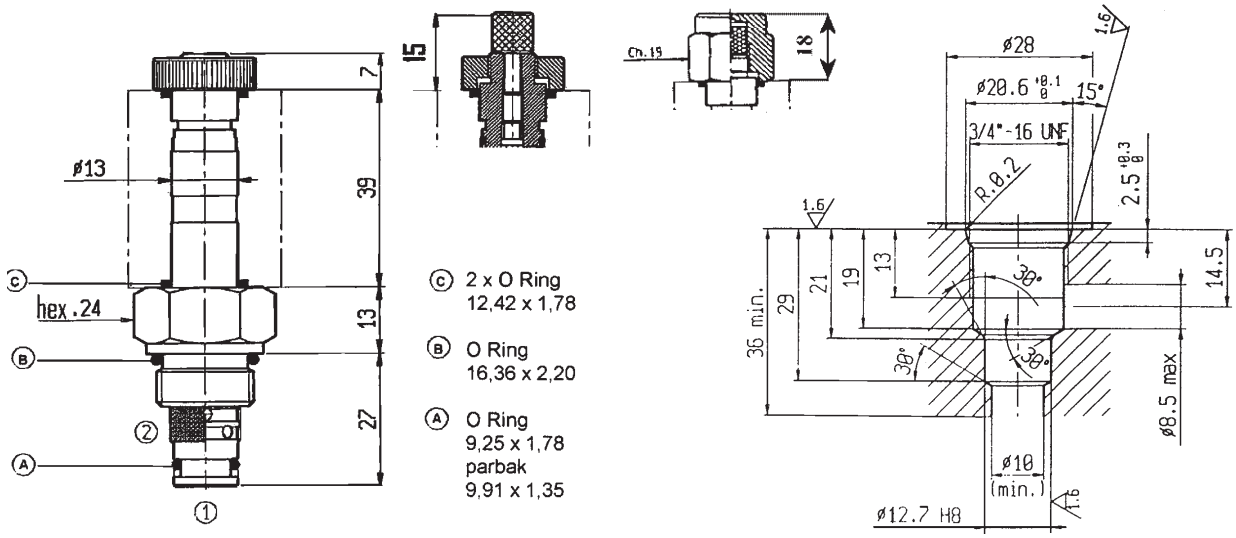
COIL	Ø13 / 18W – Plugs (not included) according to ISO 4400: see table AZ-100
C30-012C	**12V DC** – 1,55A – 7,7Ω at 20°C – 18,6W nominal power – Insulation class F
C30-024C	**24V DC** – 0,8A – 31Ω at 20°C – 19W nominal power – Insulation class F
C30-220R	**230V RAC** (rectifier plug needed) – 0,08A – 2500Ω at 20°C – 16W nominal power – Insulation class F

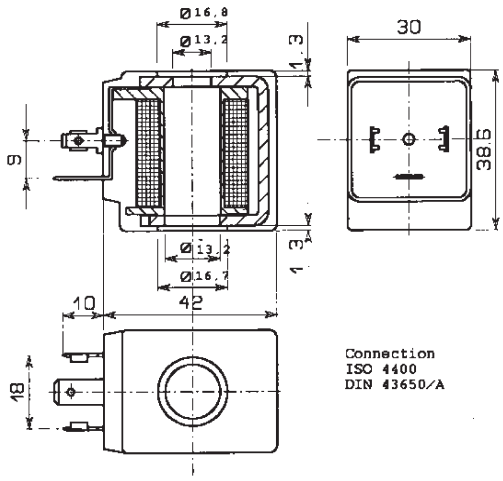
TYPICAL DIAGRAM

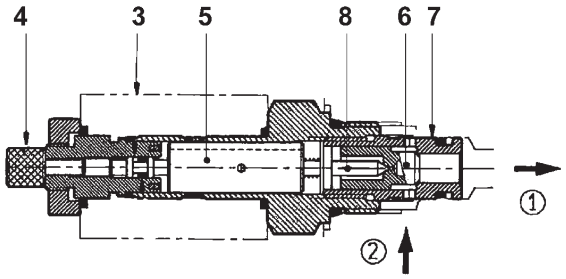
Typical **Δp-Q** curves for valves **EVC.34/ EVSC.34** in standard configuration, with mineral oil at 42cSt and 50°C for flow 2 → 1



OVERALL DIMENSIONS



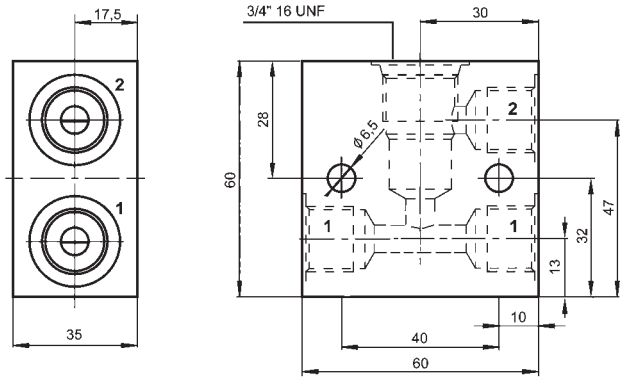




3	Coil	6	Poppet
4	Manual override	7	Seat
5	Mobile armature	8	Pilot pin

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

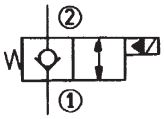
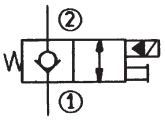


Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN VALVES type EVC2.34
N.C. 2-DIR. FLOW – SOLENOID OPERATED

- Suitable for standard cavity **3/4" 16 UNF**
- **2-way** solenoid operated poppet valves
- Normally closed, two direction flow
- Maximum operating pressure: 250 bar
- Nominal flow rate: 32 l/min
- Maximum flow rate: 40 l/min
- 100% duty cycle
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,32 kg (coil included)

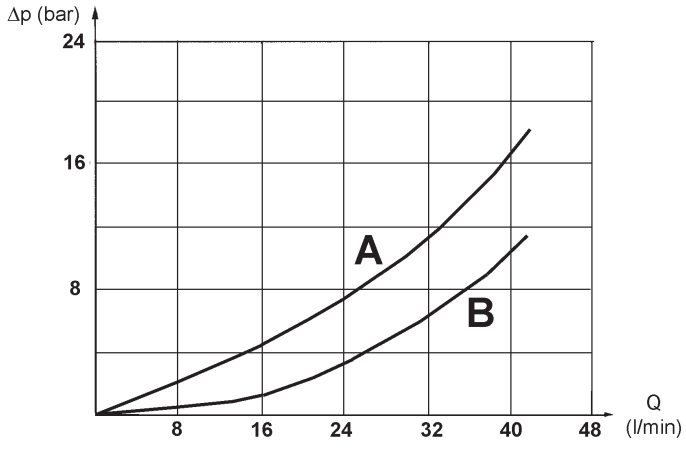
SYMBOL	
	03
	04

ORDERING CODE	
EVC2.34.03	
EVC2	2-way solenoid operated poppet valve
34	Cavity 3/4" – 16 UNF
03	**03:** standard execution **(see symbol)** **04:** manual override execution **(see symbol)**

COIL	Ø13 / 18W – Plugs (not included) according to ISO 4400: see table AZ-100
C30-012C	**12V DC** – 1,55A – 7,7Ω at 20°C – 18,6W nominal power – Insulation class F
C30-024C	**24V DC** – 0,8A – 31Ω at 20°C – 19W nominal power – Insulation class F
C30-220R	**230V RAC** (rectifier plug needed) – 0,08A – 2500Ω at 20°C – 16W nominal power – Insulation class F

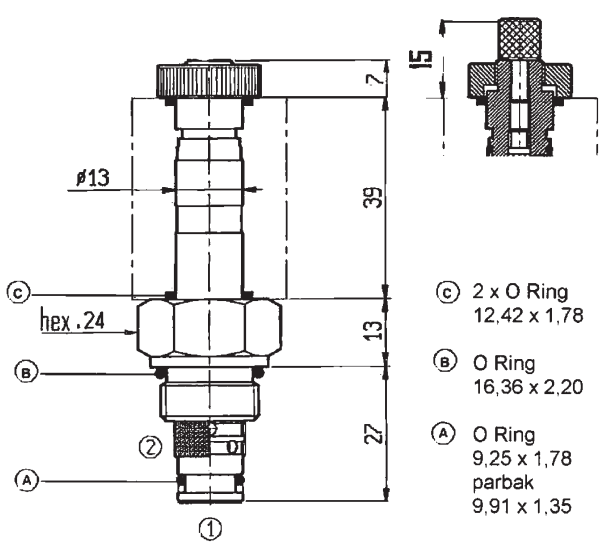
TYPICAL DIAGRAM

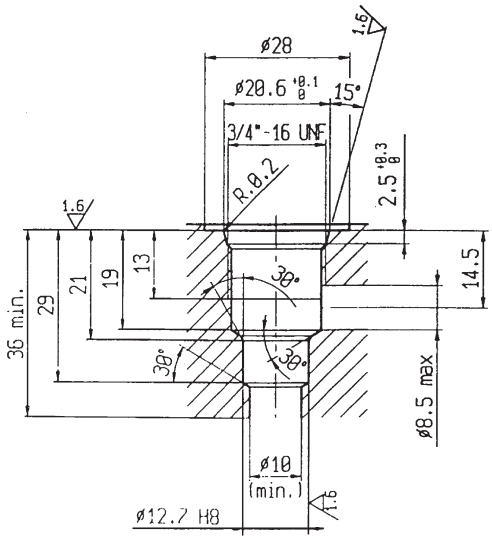
Typical **Δp-Q** curves for valves **EVC2.34** in standard configuration, with mineral oil at 42cSt and 50°C.

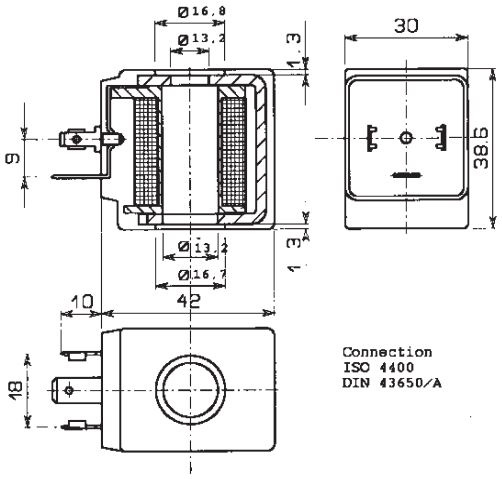


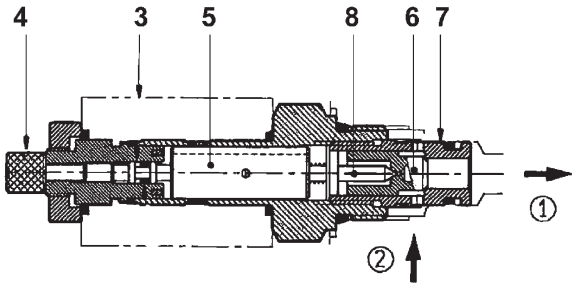
A) flow 1 → 2 **B)** flow 2 → 1

OVERALL DIMENSIONS





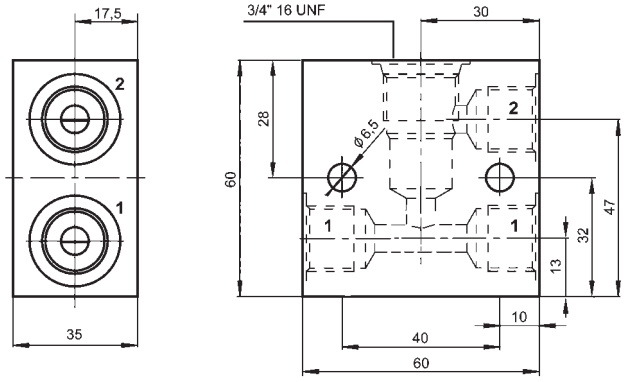




3	Coil	6	Poppet
4	Manual override	7	Seat
5	Mobile armature	8	Pilot pin

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

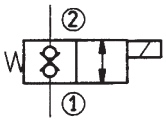
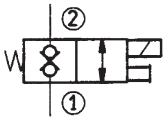


Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN VALVES type EVD.34
N.C. 2-DIR. CONTROL – SOLENOID OPERATED

- Suitable for standard cavity **3/4" 16 UNF**
- **2-way** solenoid operated poppet valves
- Normally closed, **bi-directional control**
- Maximum operating pressure: 250 bar
- Nominal flow rate: 10 l/min
- Maximum flow rate: 16 l/min
- 100% duty cycle
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,32 kg (coil included)

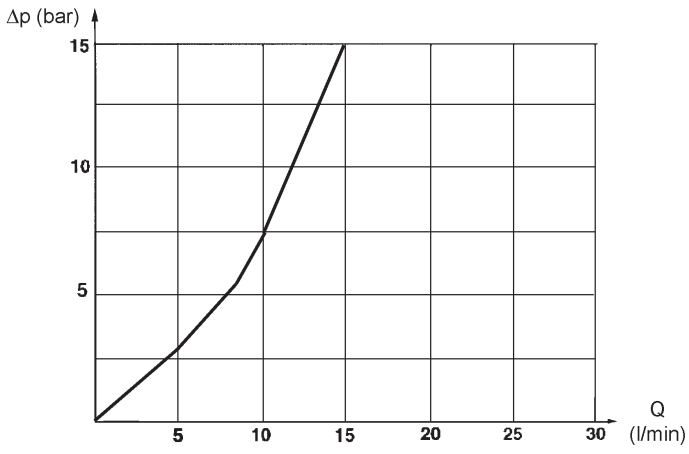
SYMBOL	
	03
	04

ORDERING CODE	
EVD.34.04	
EVD	2-way solenoid operated poppet valve
34	Cavity 3/4" – 16 UNF
04	**03:** standard execution **(see symbol)** **04:** manual override execution **(see symbol)**

COIL	Ø13 / 22W – Plugs (not included) according to ISO 4400: see table AZ-100
C36-012C	**12V DC** – 1,9A – 6,3Ω at 20°C – 22,8W nominal power – Insulation class H
C36-024C	**24V DC** – 0,95A – 25,6Ω at 20°C – 22,5W nominal power – Insulation class H
C36-220R	**230V RAC** (rectifier plug needed) – 0,11A – 1720Ω at 20°C – 22,3W nominal power – Insulation class H

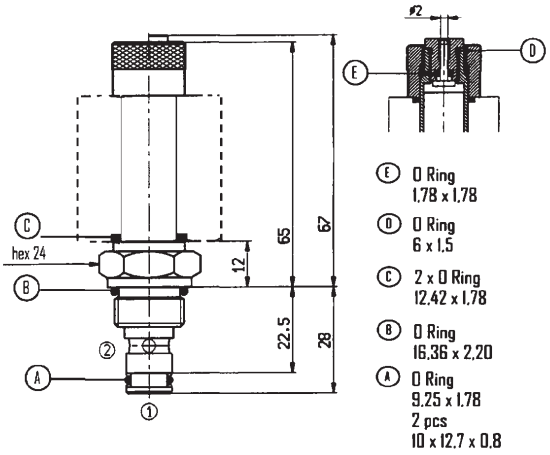
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **EVD.34** in standard configuration, with mineral oil at 42cSt and 50°C.



Flow: 1 → 2 and 2 → 1

OVERALL DIMENSIONS



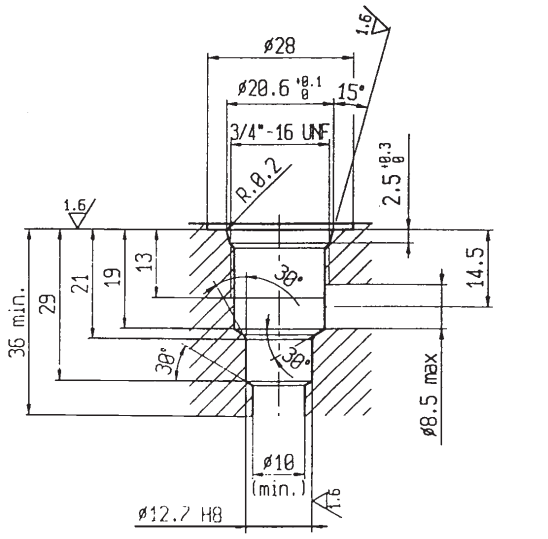
E O Ring
1.78 x 1.78

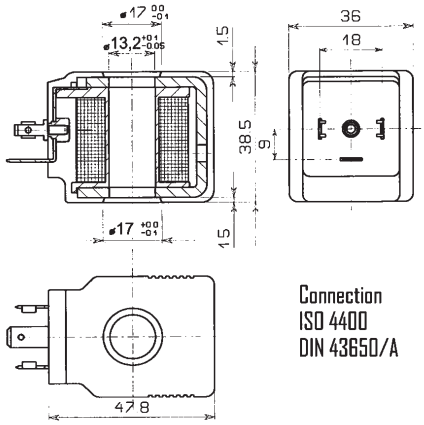
D O Ring
6 x 1.5

C 2 x O Ring
12.42 x 1.78

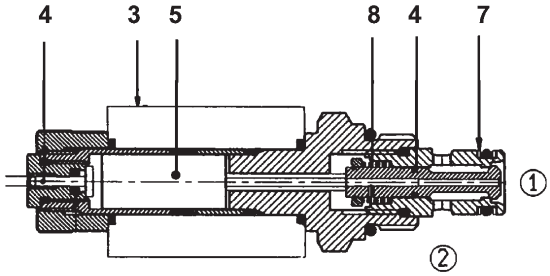
B O Ring
16.36 x 2.20

A O Ring
9.25 x 1.78
2 pcs
10 x 12.7 x 0.8





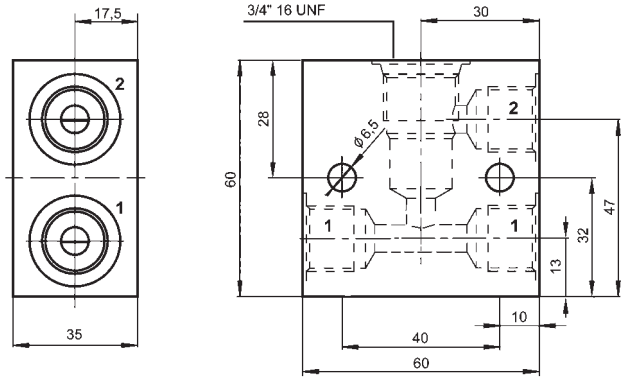
Connection
ISO 4400
DIN 43650/A



3	Coil	6	Poppet
4	Manual override	7	Seat
5	Mobile armature	8	Spring

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

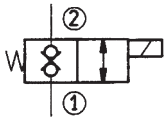
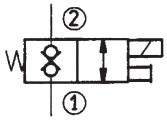


Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN VALVES type EVD2.34
N.C. 2-DIR. CONTROL – SOLENOID OPERATED

- Suitable for standard cavity **3/4" 16 UNF**
- **2-way** solenoid operated poppet valves
- Normally closed, **bi-directional control**
- Maximum operating pressure: 250 bar
- Nominal flow rate: 16 l/min
- Maximum flow rate: 25 l/min
- 100% duty cycle
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,32 kg (coil included)

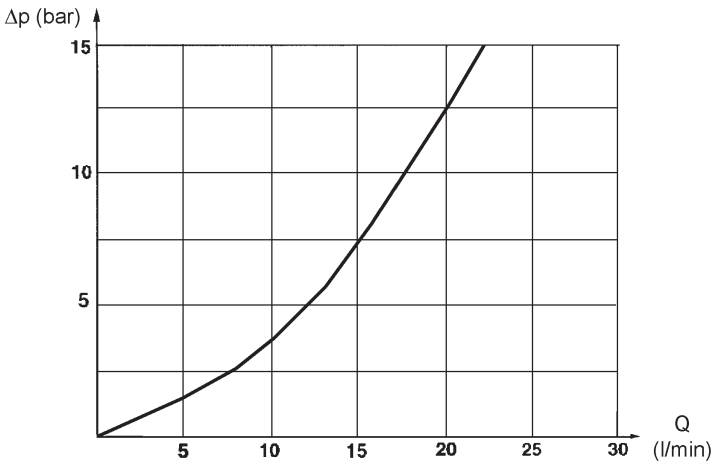
SYMBOL	
	03
	04

ORDERING CODE	
EVD2.34.03	
EVD2	2-way solenoid operated poppet valve
34	Cavity 3/4" – 16 UNF
03	**03:** standard execution **(see symbol)** **04:** manual override execution **(see symbol)**

COIL	
	Ø13 / 22W – Plugs (not included) according to ISO 4400: see table AZ-100
C36-012C	**12V DC** – 1,9A – 6,3Ω at 20°C – 22,8W nominal power – Insulation class H
C36-024C	**24V DC** – 0,95A – 25,6Ω at 20°C – 22,5W nominal power – Insulation class H
C36-220R	**230V RAC** (rectifier plug needed) – 0,11A – 1720Ω at 20°C – 22,3W nominal power – Insulation class H

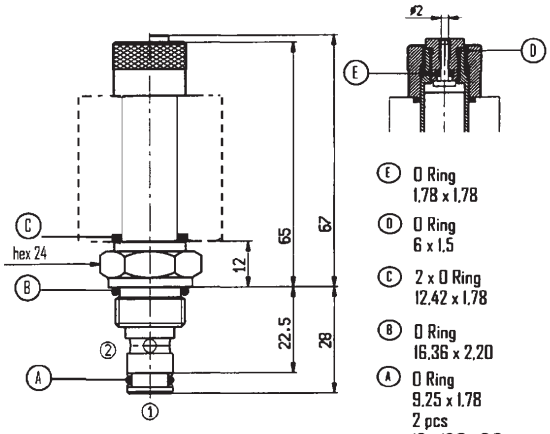
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **EVD2.34** in standard configuration, with mineral oil at 42cSt and 50°C.



Flow: 1 → 2 and 2 → 1

OVERALL DIMENSIONS



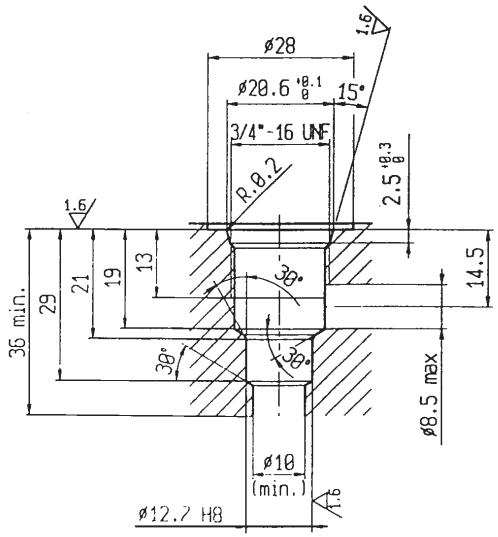
E O Ring
1.78 x 1.78

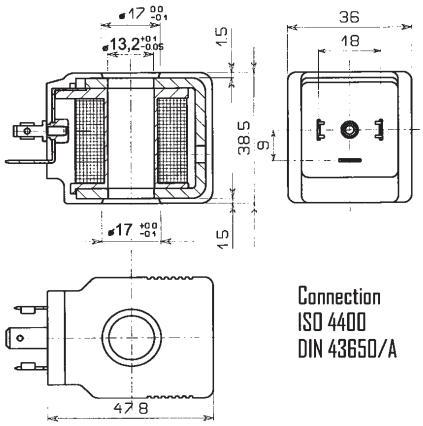
D O Ring
6 x 1.5

C 2 x O Ring
12.42 x 1.78

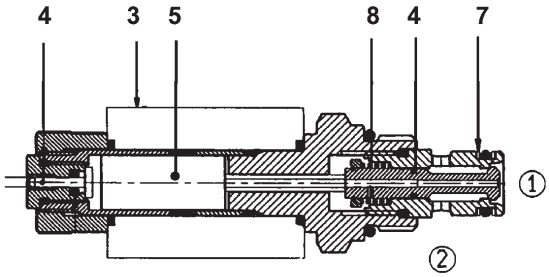
B O Ring
16.36 x 2.20

A O Ring
9.25 x 1.78
2 pcs
10 x 12.7 x 0.8





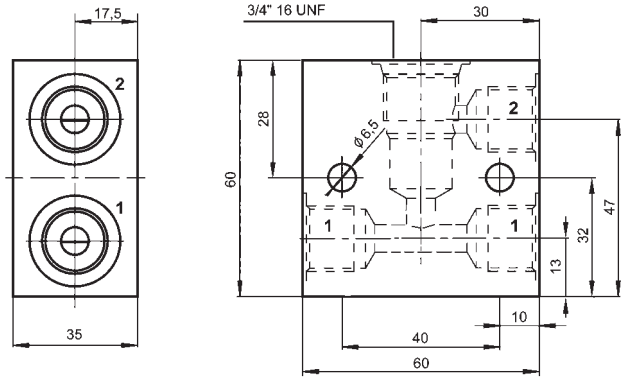
Connection
ISO 4400
DIN 43650/A



3	Coil	6	Poppet
4	Manual override	7	Seat
5	Mobile armature	8	Spring

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY



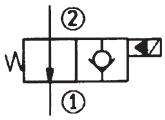
Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN VALVES type EVO.34
N.O. 1-DIR. FLOW – SOLENOID OPERATED

- Suitable for standard cavity **3/4" 16 UNF**
- **2-way** solenoid operated poppet valves
- **Normally open**, one direction flow
- Maximum operating pressure: 250 bar
- Nominal flow rate: 20 l/min
- Maximum flow rate: 30 l/min
- 100% duty cycle
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,32 kg (coil included)

SYMBOL



ORDERING CODE

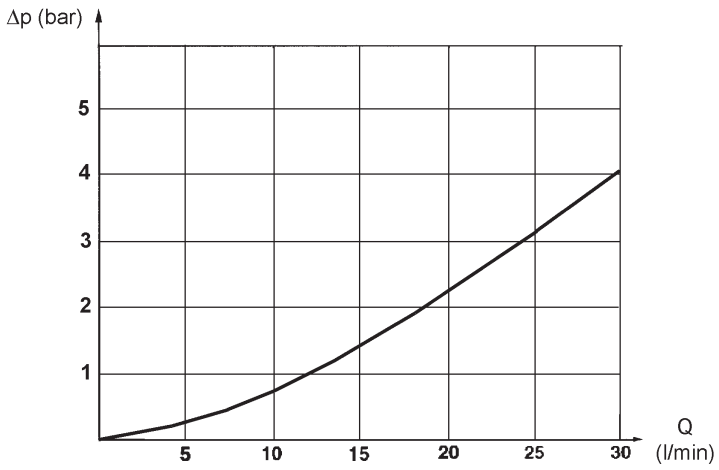
EVO.34.03

EVO	2-way solenoid operated poppet valve
34	Cavity 3/4" – 16 UNF
03	standard execution

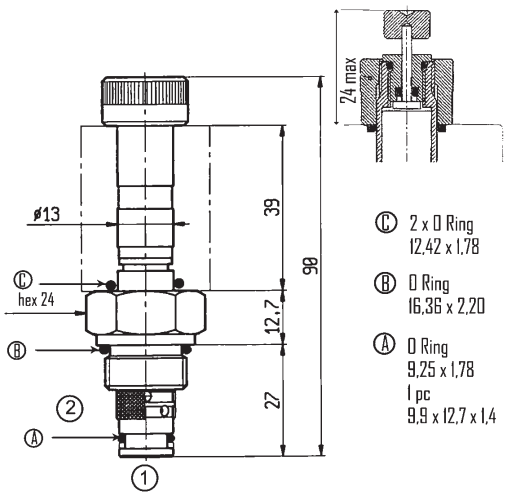
COIL	Ø13 / 18W – Plugs (not included) according to ISO 4400: see table AZ-100
C30-012C	**12V DC** – 1,55A – 7,7Ω at 20°C – 18,6W nominal power – Insulation class F
C30-024C	**24V DC** – 0,8A – 31Ω at 20°C – 19W nominal power – Insulation class F
C30-220R	**230V RAC** (rectifier plug needed) – 0,08A – 2500Ω at 20°C – 16W nominal power – Insulation class F

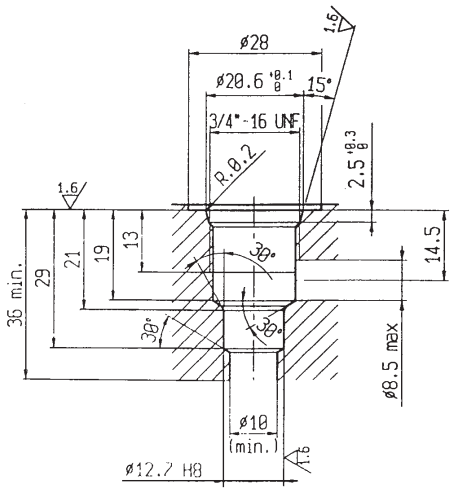
TYPICAL DIAGRAM

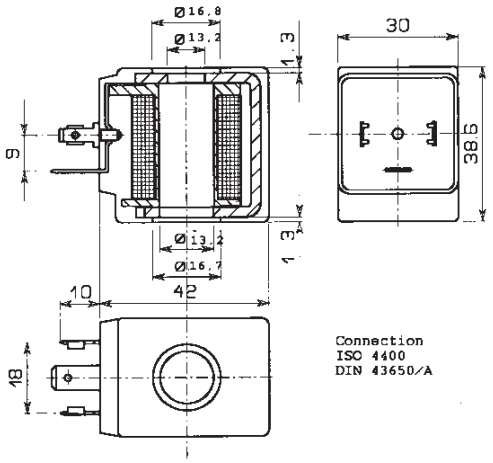
Typical **Δp-Q** curves for valves **EVO.34** in standard configuration, with mineral oil at 42cSt and 50°C for flow 2 → 1

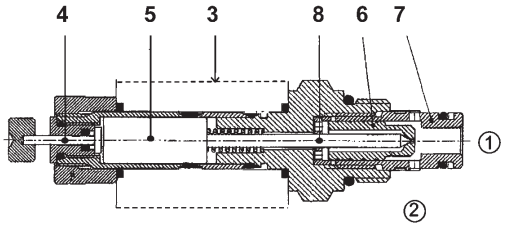


OVERALL DIMENSIONS





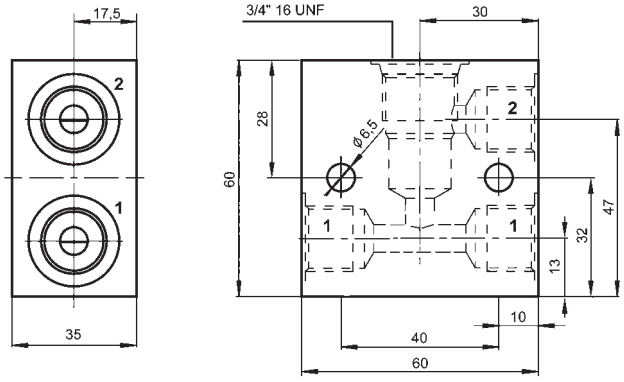




3	Coil	6	Poppet
4	Manual override	7	Seat
5	Mobile armature	8	Pilot pin

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

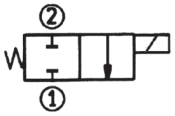
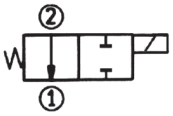


Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN SPOOL VALVES type EV2*.34
2-WAY SOLENOID OPERATED

- Suitable for standard cavity **3/4" 16 UNF**
- Maximum operating pressure: 250 bar
- Maximum recommended flow rate: 20 l/min
- 100% duty cycle
- Steel body
- Spool in hardened and grinded steel
- Mass 0,32 kg (coil included)

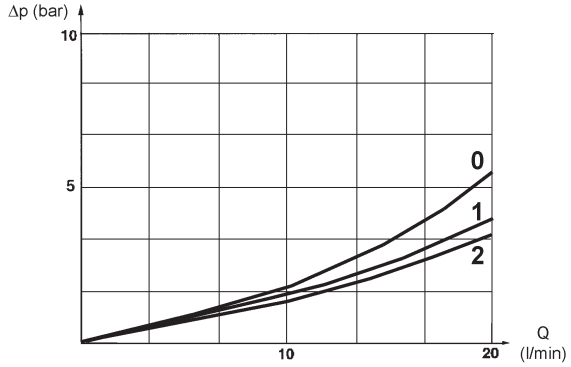
SYMBOL	
	C
	O

ORDERING CODE	
EV2C.34.03	
EV2	2-way solenoid operated spool valve
C	**C**: normally closed **(see symbol)** **O**: normally open **(see symbol)**
34	Nominal size (3/4" 16 UNF)
03	Standard execution

COIL	Ø13 / 22W — Plugs (not included) according to ISO 4400: see table AZ-100
C36-012C	**12V DC** — 1,9A — 6,3Ω at 20°C — 22,8W nominal power — Insulation class H
C36-024C	**24V DC** — 0,95A — 25,6Ω at 20°C — 22,5W nominal power — Insulation class H
C36-220R	**230V RAC** (rectifier plug needed) — 0,11A — 1720Ω at 20°C — 22,3W nominal power — Insulation class H

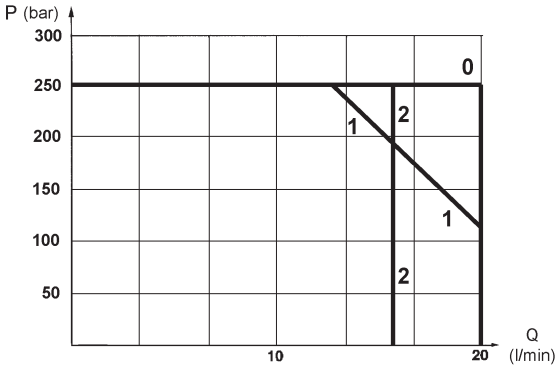
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **EV2*.34** in standard configuration, with mineral oil at 42cSt and 60°C for flow 2→1 and 1→2



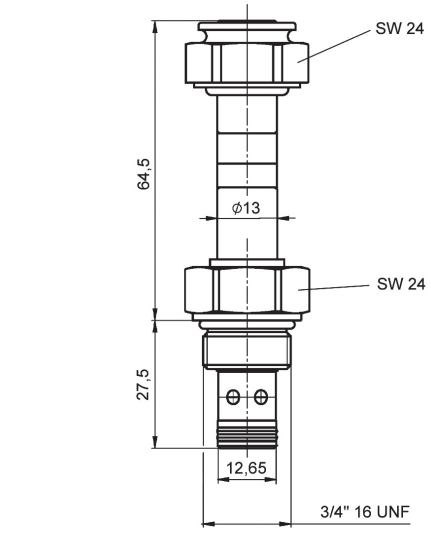
0) "C" type, 1→2 and 2→1 **1)** "O" type, 1→2 **2)** "O" type, 2→1

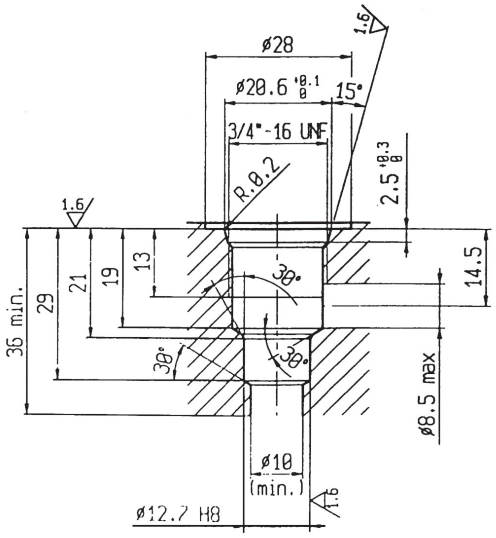
Typical **Δp-Q** curves of operating limits for maximum hydraulic power transferred by valves **EV2*.34**

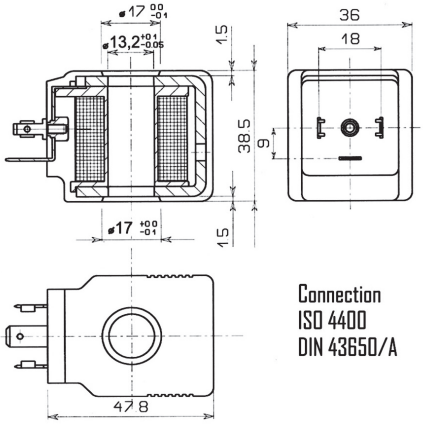


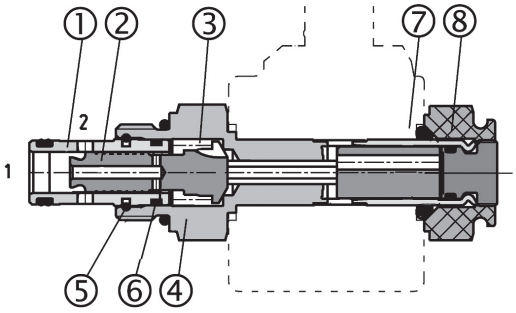
0) "C" type, 1→2 and "O" type 2→1 **1)** "O" type, 1→2 **2)** "C" type, 2→1

OVERALL DIMENSIONS





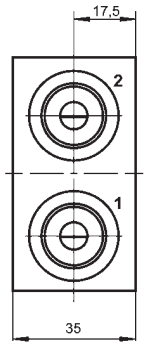


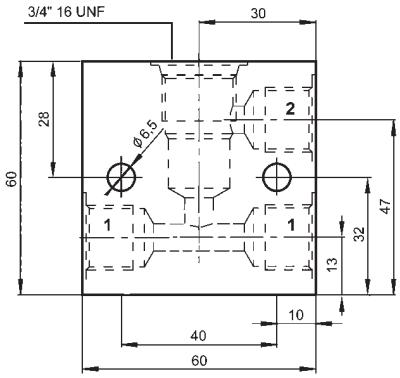


1	Body	5	Wire ring
2	Spool	6	Seal
3	Spring	7	Coil
4	Cartridge	8	Retaining nut

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY



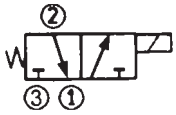
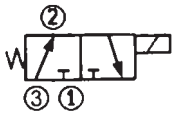


Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN SPOOL VALVES type EV3*.34
3-WAY SOLENOID OPERATED

- Suitable for standard cavity **3/4" 16 UNF**
- Maximum operating pressure: 250 bar
- Maximum recommended flow rate: 20 l/min
- 100% duty cycle
- Steel body
- Spool in hardened and grinded steel
- Mass 0,37 kg (coil included)

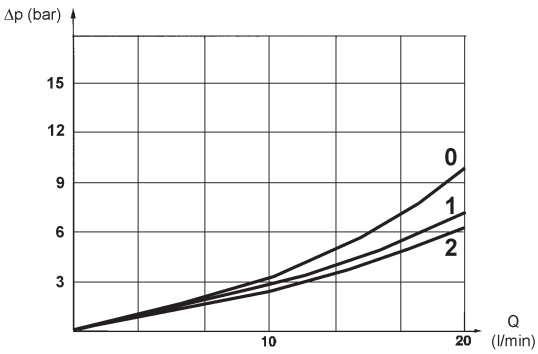
SYMBOL	
	C
	O

ORDERING CODE	
EV3C.34.03	
EV3	3-way solenoid operated spool valve
C	**C:** normally closed **(see symbol)** **O:** normally open **(see symbol)**
34	Nominal size (3/4" 16 UNF)
03	Standard execution

COIL	
C36-012C	**12V DC** – 1,9A – 6,3Ω at 20°C – 22,8W nominal power – Insulation class H
C36-024C	**24V DC** – 0,95A – 25,6Ω at 20°C – 22,5W nominal power – Insulation class H
C36-220R	**230V RAC** (rectifier plug needed) – 0,11A – 1720Ω at 20°C – 22,3W nominal power – Insulation class H

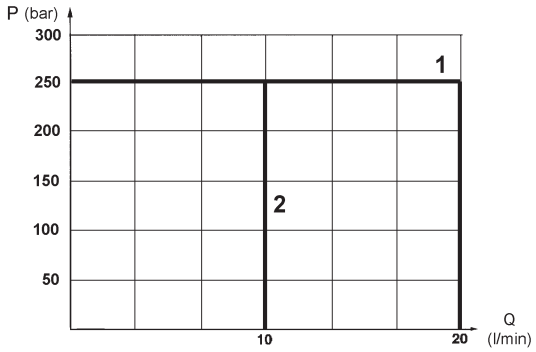
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **EV3*.34** in standard configuration, with mineral oil at 42cSt and 60°C for flow 2→1 and 3→2



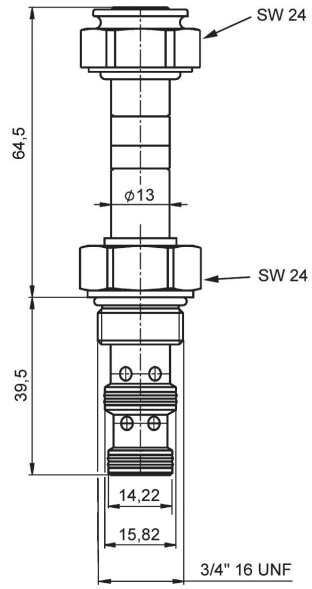
0) "O" type, 3→2 **1)** "O" type and "C" type, 2→1 **2)** "C" type, 3→2

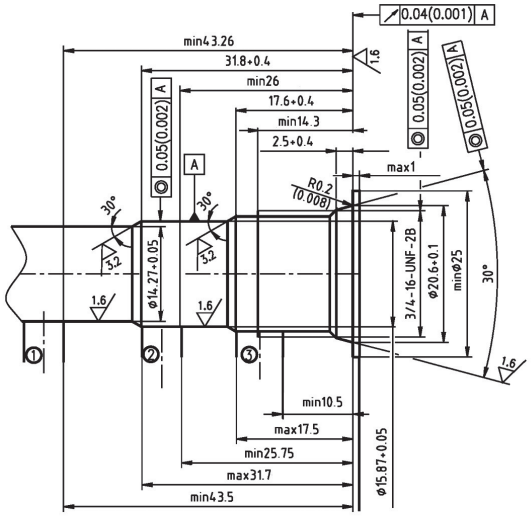
Typical **Δp-Q** curves of operating limits for maximum hydraulic power transferred by valves **EV3*.34**

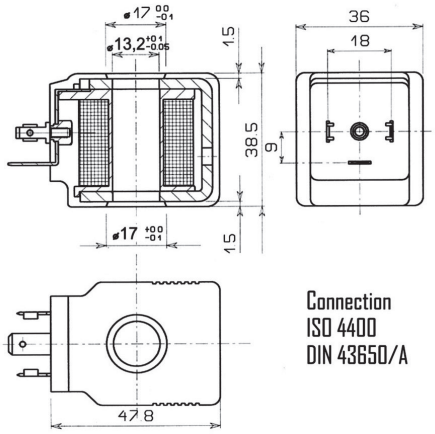


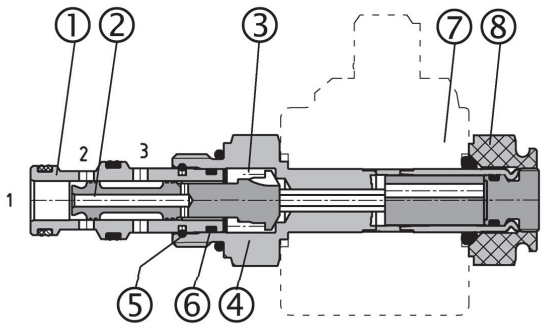
1) "C" type, 2→1 and 3→2 **2)** "O" type, 3→2 and 2→1

OVERALL DIMENSIONS





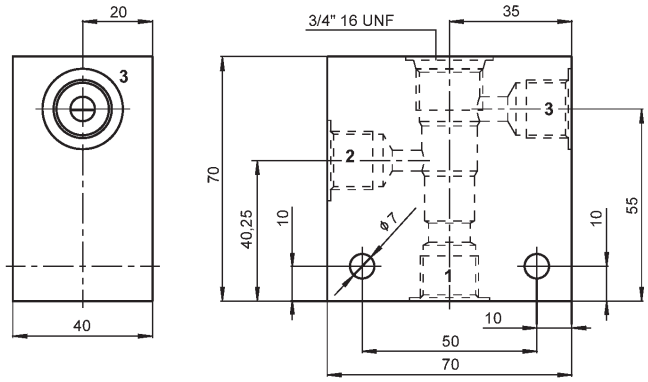




1	Body	5	Wire ring
2	Spool	6	Seal
3	Spring	7	Coil
4	Cartridge	8	Retaining nut

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

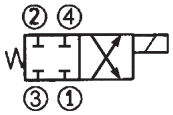
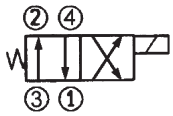


Code	Ports
LAB-34-3/38	3/8“ BSP
Mass: 0,25 kg	

Suitable for standard 3-way screw-in valves, cavity 3/4“ 16 UNF. Designed for in-line assembly. Material: aluminium.

HYDRAULIC SCREW-IN SPOOL VALVES type EV4**.34
4-WAY SOLENOID OPERATED

- Suitable for standard cavity **3/4" 16 UNF**
- Maximum operating pressure: 250 bar
- Maximum recommended flow rate: 20 l/min
- 100% duty cycle
- Steel body
- Spool in hardened and grinded steel
- Mass 0,40 kg (coil included)

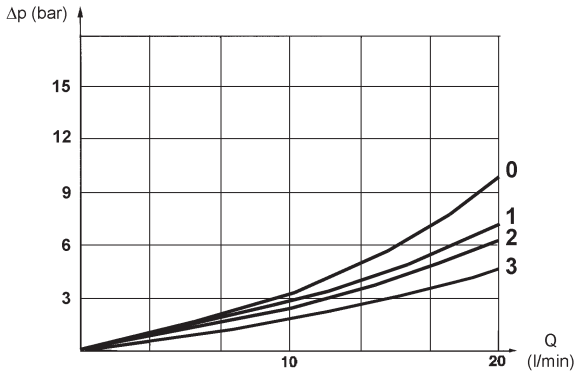
SYMBOL	
	CX
	PX

ORDERING CODE	
EV4CX.34.03	
EV4	4-way solenoid operated spool valve
CX	**CX:** normally closed **(see symbol)** **PX:** normally open **(see symbol)**
34	Nominal size (3/4" 16 UNF)
03	Standard execution

COIL	
C36-012C	**12V DC** – 1,9A – 6,3Ω at 20°C – 22,8W nominal power – Insulation class H
C36-024C	**24V DC** – 0,95A – 25,6Ω at 20°C – 22,5W nominal power – Insulation class H
C36-220R	**230V RAC** (rectifier plug needed) – 0,11A – 1720Ω at 20°C – 22,3W nominal power – Insulation class H

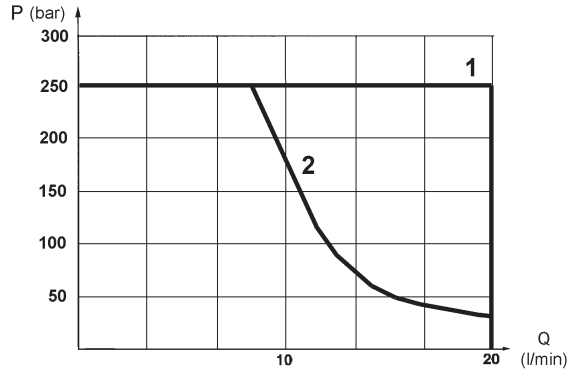
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **EV4**.34** in standard configuration, with mineral oil at 42cSt and 60°C



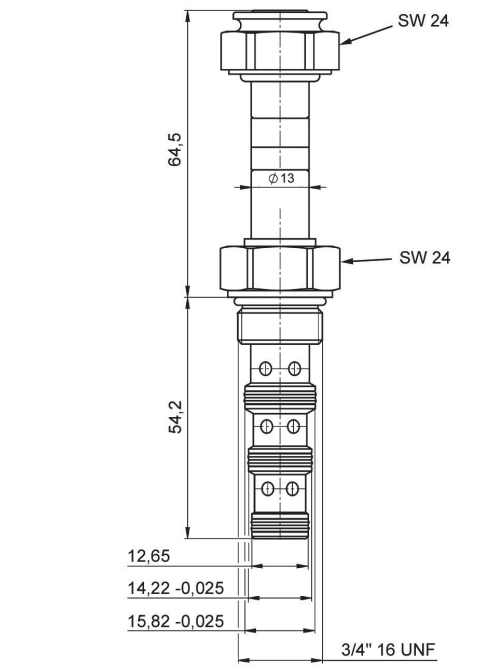
0) "PX" type, 4→1
1) "PX" type, 2→1
2) "CX" type, 2→1 and "PX" type, 3→2
3) "CX" type, 3→4 and "PX" type, 3→4

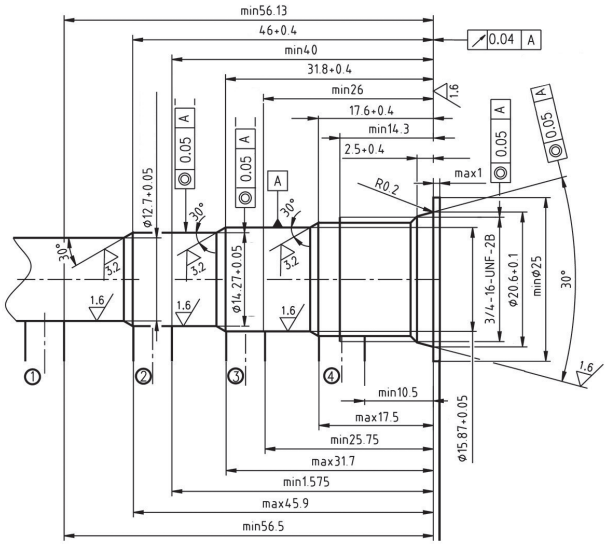
Typical **Δp-Q** curves of operating limits for maximum hydraulic power transferred by valves **EV4**.34**

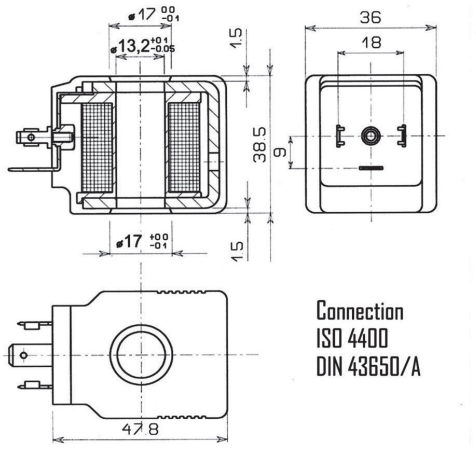


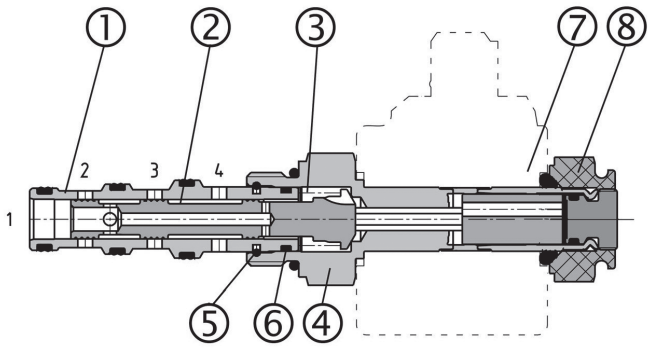
1) "CX" type, 2→1 and 3→4
2) "PX" type, 3→2 and 4→1
2) "PX" type, 3→4 and 2→1

OVERALL DIMENSIONS





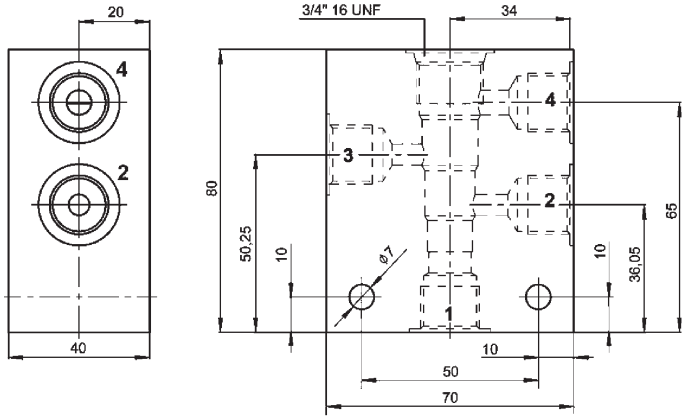




1	Body	5	Wire ring
2	Spool	6	Seal
3	Spring	7	Coil
4	Cartridge	8	Retaining nut

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

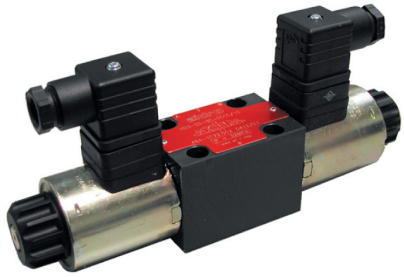


Code	Ports
LAB-34-4/38	3/8“ BSP
Mass: 0,54 kg	

Suitable for standard 4-way screw-in valves, cavity 3/4“ 16 UNF. Designed for in-line assembly. Material: aluminium.

ISO 03 PROPORTIONAL HYDRAULIC VALVES type HD3-PS
DIRECTIONAL CONTROL - SOLENOID CONTROLLED

- 4-way directional valves, proportional electric control
- **ISO 03** interface
- Oil immersed solenoids for DC current
- Emergency pin for manual override
- Nominal flow rate: 32 l/min with Δ p=10bar
- Maximum pressure (port P-A-B): 320bar
- Maximum pressure (port T): 160bar
- Hysteresis $\leq$ 6%
- Suitable for mineral oil according to ISO 16/14/12 filtration class or better. Recommended viscosity range: 10 to 60cSt

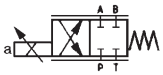
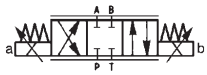
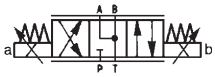


ORDERING CODE

HD3 – PS – 1PC – R4 / 10

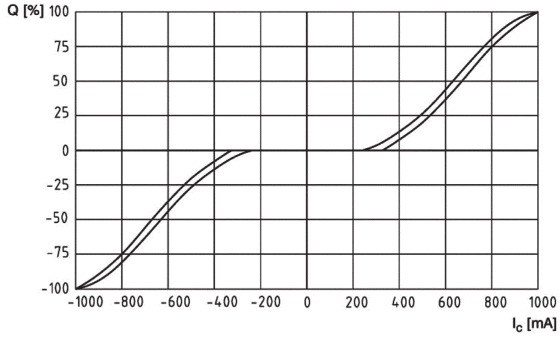
HD3	ISO 03 4-way directional control valve
PS	Proportional electric control
1PC	Spool type and drive arrangement **(see table)**
R4	24 DC proportional solenoid - R(20°C)=13,4 Ω – IMAX=1,0A - The solenoid must be energized by an electronic driver capable of full control of min and max current value. We recommend UED-M15 type (see table ED-M15)
10	Drawing

SPOOL TYPE

1PML	
1PC	
3PC	

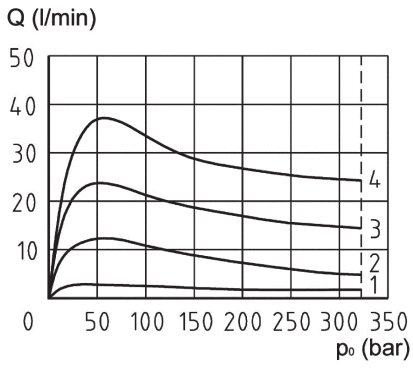
TYPICAL DIAGRAM

Flow characteristics in relation to exciting current for valves HD3-PS in standard configuration, with mineral oil at 35cSt and 50°C with Δ p=10bar



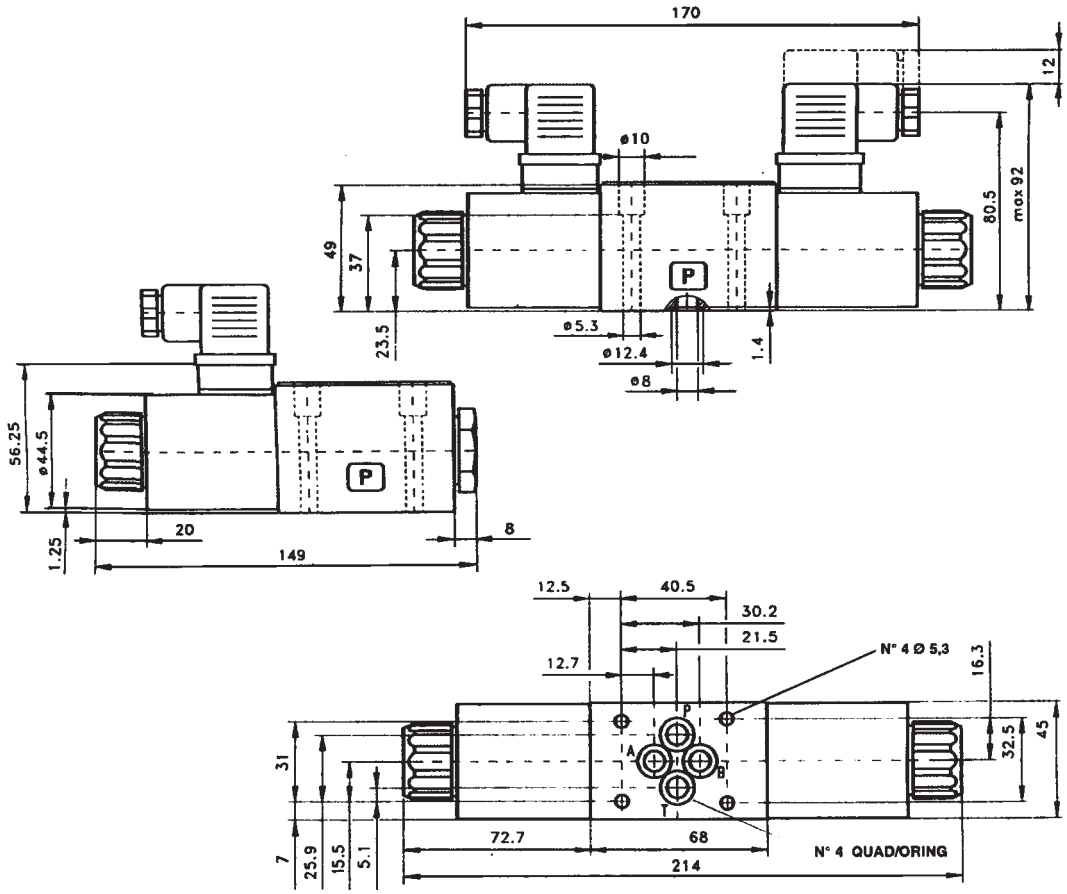
The coil current which initialise the flow through the proportional directional valve can differ with a tolerance range of ±6%

Typical p-Q curves of operating limits for HD3-PS valves at different solenoid current values, with mineral oil at 35cSt and 50°C



1) 40% solenoid current value 2) 60% solenoid current value
3) 80% solenoid current value 4) 100% solenoid current value

OVERALL DIMENSIONS



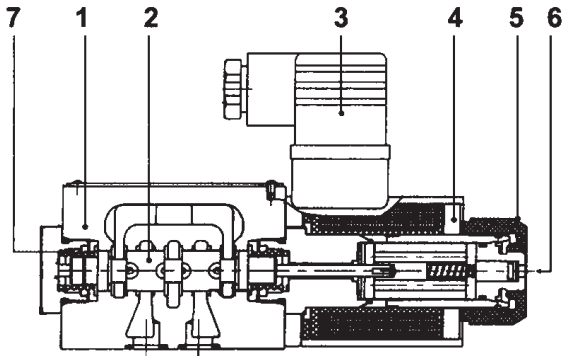
Fixing bolts: n.4 M5 x 45 (not included) – Tightening torque 8Nm

Valve mass: 1,60kg (with 1 coil) – 2,10kg (with 2 coils)

Subject to technical and dimensional changes without notice

TYPICAL SECTION

1	Body	5	Locking nut
2	Spool	6	Emergency pin
3	ISO 4400 plugs (not included)	7	Spring
4	Solenoid		



ISO 05 PROPORTIONAL HYDRAULIC VALVES type HD5-PS
DIRECTIONAL CONTROL - SOLENOID CONTROLLED

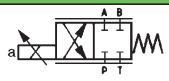
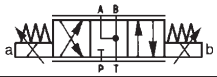
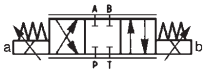
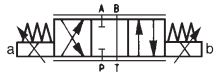
- 4-way directional valves, proportional electric control
- **ISO 05** interface
- Oil immersed solenoids for DC current
- Emergency pin for manual override
- Nominal flow rate: 60 l/min with Δ p=10bar
- Maximum pressure (port P-A-B): 320bar
- Maximum pressure (port T): 210bar
- Hysteresis $\leq$ 6%
- Suitable for mineral oil according to ISO 16/14/12 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

ORDERING CODE

HD5 – PS – 7PC – R4 / 10

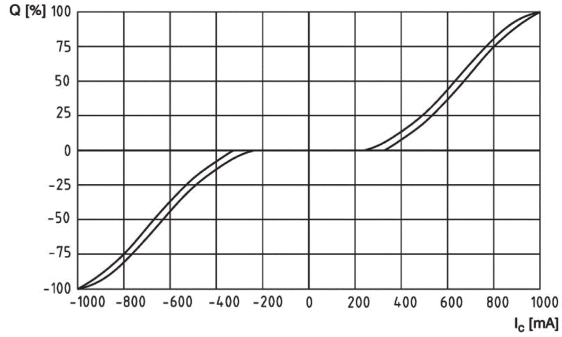
HD5	ISO 05 4-way directional control valve
PS	Proportional electric control
7PC	Spool type and drive arrangement
R4	24 VDC proportional solenoid - R(20°C)=13,9 Ω – IMAX=1,1A - The solenoid must be energized by an electronic driver capable of full control of min and max current value. We recommend UED-M15 type (see table ED-M15)
10	Drawing

SPOOL TYPE

1PML		3PC	
1PC		7PC	

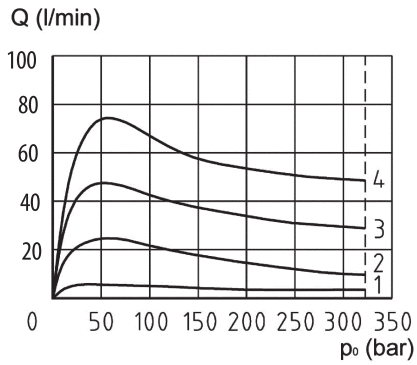
TYPICAL DIAGRAM

Flow characteristics in relation to exciting current for valves HD5-PS in standard configuration, with mineral oil at 35cSt and 50°C with Δ p=10bar



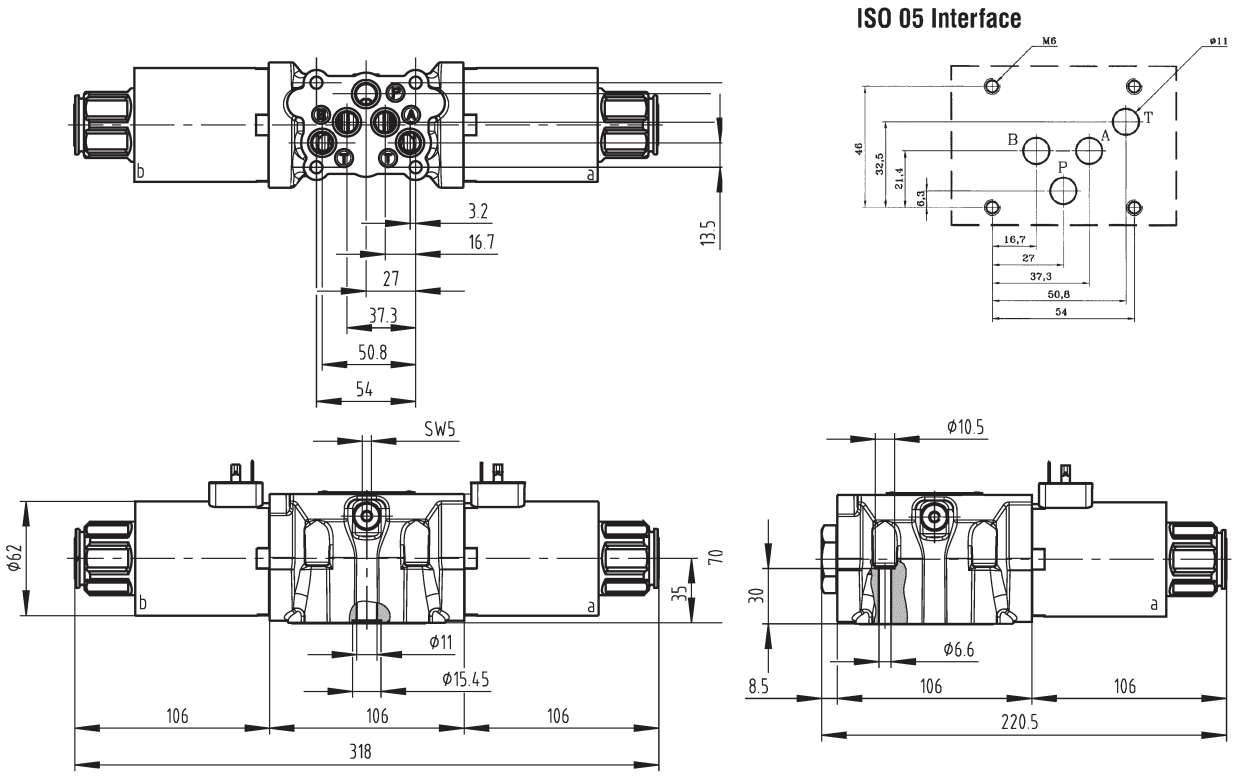
The coil current which initialise the flow through the proportional directional valve can differ with a tolerance range of ±6%

Typical p-Q curves of operating limits for HD5-PS valves at different solenoid current values, with mineral oil at 35cSt and 50°C



1) 40% solenoid current value 2) 60% solenoid current value
3) 80% solenoid current value 4) 100% solenoid current value

OVERALL DIMENSIONS



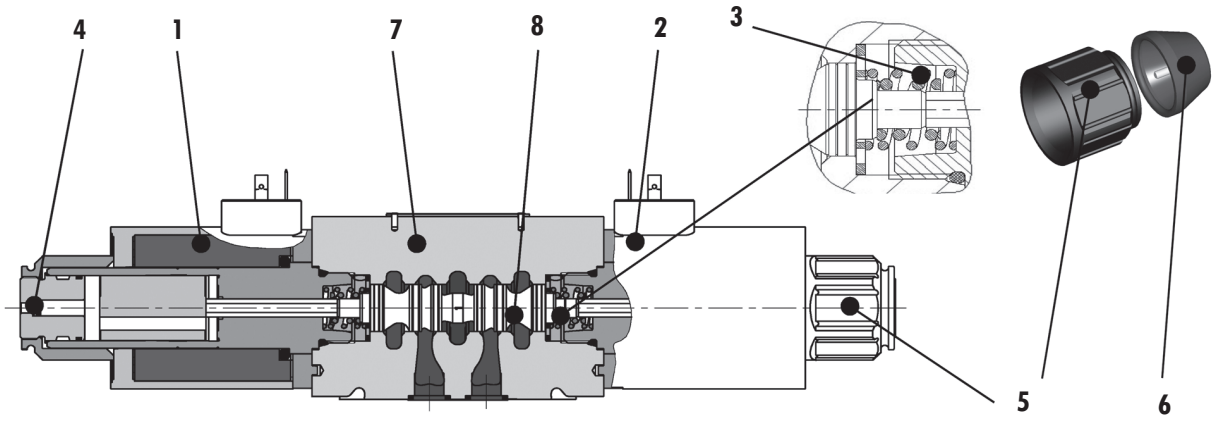
Fixing bolts: n.4 M6 x 40 (not included) – Tightening torque 14Nm

Valve mass: 3,90kg (with 1 coil) – 5,40kg (with 2 coils)

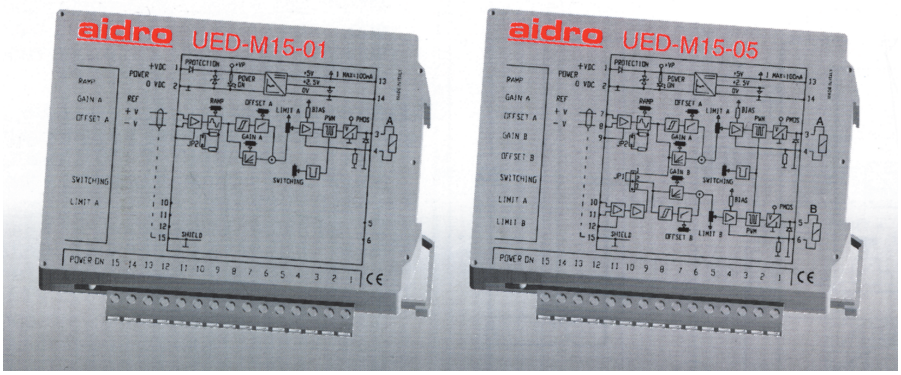
Subject to technical and dimensional changes without notice

TYPICAL SECTION

1-2	Solenoid	6	Emergency manual override (on request)
3	Double spring configuration	7	Body
4	Emergency pin	8	Spool
5	Coil retaining nut		



UNIVERSAL ELECTRONIC DRIVES type UED-M15 FOR SOLENOID OPERATED PROPORTIONAL VALVES



2 CHARACTERISTICS OF STANDARD UED-M15-**

Voltage supply: 10 to 28V DC.

Max ripple: ±10% V supply

Currents: limit "A" = 2,5A
limit "B" = 2,5A
bias = 50mA

Offset "A": 0 to 50% of limit "A"

Offset "B": 0 to 50% of limit "B"

Switching: dither frequency 110Hz

Auxiliary V: VR=5V ± 1% (max 100 mA)

Ref. signals:
UED-M15-01 : 0→+10V
(or 2,5V→+5V)
UED-M15-05: -10V←0→+10V
(or 0←2,5 →+5V)

Ramp time:
from 0,02 sec to 5 sec

Gain "A":
scale from 0,25A/V to "0" A/V
(or from 1A/V to "0" A/V)

Gain "B":
scale from 0,25A/V to "0" A/V
(or from 1 A/V to "0" A/V)

Temperature:
permissible range from 25°C to 75°C

EMC protection:
CE "heavy industrial"

Container:
IP-30 protection

Technology:
SMD, on one card.

1 HOW TO READ THE MODEL CODE FOR UED-M15-*

UED	-	M15	- (05)	(R)	-	*	-	*	/	10
①		②	③	④		⑤		⑥		⑦

① UED : universal electronic driver (see 2)

② M15 : wiring by a 15 (screw) terminals strip

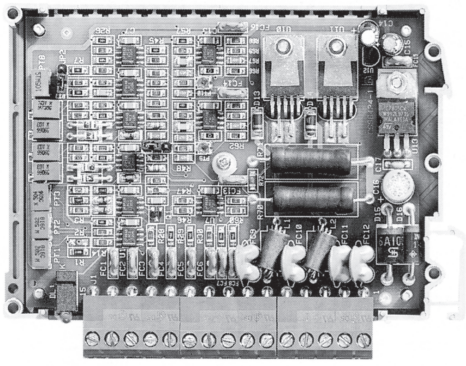
③ (05) : channels
01 : 1 channel "A"
05 : 2 channels "A" and "B" for bisolenoid valves

④ (R) : ramp
- : standard ramp with adjustable time from 0,02 sec to 5 sec.
R: reduced time ramp, adjustable from 0,01 sec to 1 sec.

⑤ - : current limit "A":
- : standard at 2,5A
20 : limited at 2,0A
10 : limited at 1,0A
08 : limited at 0,8A

⑥ - : current limit "B": see ⑤

⑦ 10 : design number (progressive) of the universal electronic driver



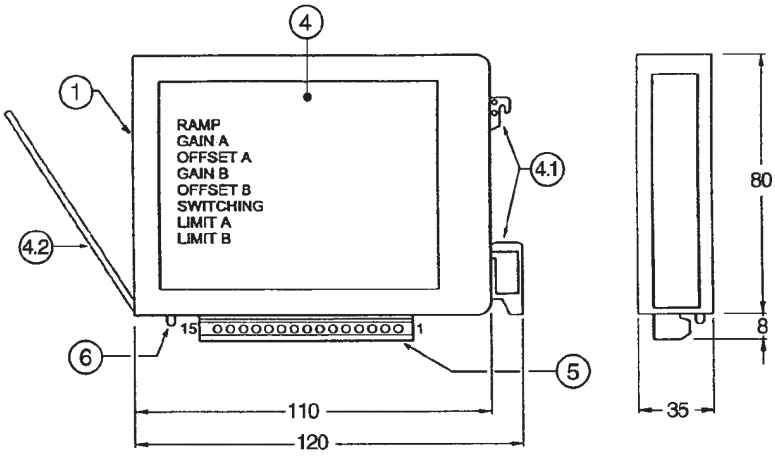
UED-M15-**

① Types : UED-M15-01 for 1 monosolenoid valve
UED-M15-05 for 1 bisolenoid valve

④ Housing : box (approx 110x80x35 mm) with profiles for installation on DIN EN 50.022 guide ㊶ with door ㊷ access to calibration trimmers

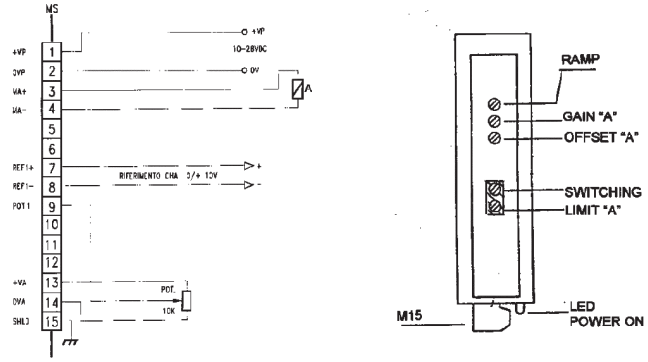
⑤ Connections : by a 15 (screw) terminals strip

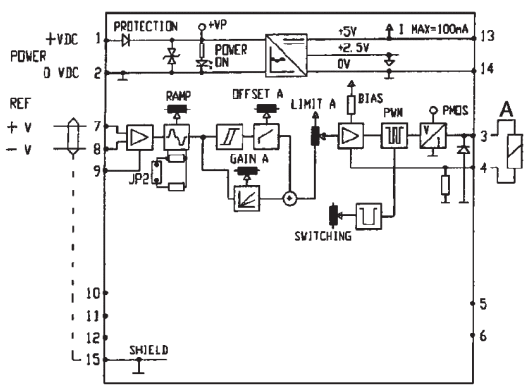
⑥ Power supply : 10 to 28 V DC. Power on is signalled by a Green LED ⑥



All dimensions are mm

UED-M15-01
FOR MONOSOLENOID PROPORTIONAL VALVES
connections and adjustements





INSTALLATION OF DRIVERS TYPE UED-M15-**

1) Mechanical installation of UED-M15-** - Universal electronic drivers - can be made on guide EN 50.022 or otherwise. The container box is made of poliammide 6.6, can stand max temperature of 80°C, with flammability grade UL 94V-0 and gives protection IP30.
Keep the box far from source of heat.

2) Wiring:
Wiring of the UED-M15-** to the valve, power source etc... is made by the 15 terminals strip by use of wires of appropriate sections.

2.1) Power supply:
Connections are made from terminal 1 (+) and terminal 2 ("0") to a suitable source of power at 0→10V/28V (ripple included). This permit the use of UED-M15 with a wide choice of source like 12-14V, 24-27V battries, DC generators and rectified filtered alternate current.
When power is on, a green LED is activated.

2.2) Valve solenoid(s):
Channel "A" is wired from terminal 3 (+) and terminal 4 (-) to the connector of the valve's solenoid.
Channel "B" (on UED-M15-05) is wired from terminal 5 (+) and terminal 6 (-) to the connector of the second solenoid.

2.3) External reference signal
External reference signal, coming from a voltage generator, PLC, etc... :

- on UED-M15-01:
0→+10V wired at terminal 7 (+) and 8 (-)

- on UED-M15-05:
-10V← 0→+10V wired at terminal 7 (+) and 8 (-).
0→+10V activate channel "A"
-10V←0 activate channel "B"

In case of "single ended" reference, (same ground for reference system and driver), terminals 8 (channel "A") and 11 (channel "B") must be connected to 14 (OVA).

2.4) Reference signal from potentiometer(s)
This is alternative to the external reference signal and it can be obtained from the 0+5V (VR) auxiliary source available at terminal 13 (+) and 14 ("0") by use of potentiometer(s) of suggested 10 KΩ resistance .
The potentiometer(s) extremes are wired to terminal 13 (+) and terminal 14 ("0") and the slider(s) are to be wired:

- on UED-M15-01:
at terminal 9 with a "significant" signal of 2,5V→5V for channel "A"

- on UED-M15-05:
at terminal 9 with a "significant" signal

of 2,5V→5V for channel "A" and
0 ← 2,5V for channel "B".

- On UED-M15-11:
at terminal 9 with a "significant" signal of 2,5V→5V for channel "A"
at terminal 12 with a "significant" signal of 2,5V→5V for channel "B"

2.5) Ground
Terminal 15 must be connected or wired to ground.

2.6) Wiring of external reference source or potentiometer must be made by shielded cables.

MEASURING OF ELECTRIC PARAMETERS

A simple voltmeter is enough to make the elementary tests that normally are required:

Voltage of the power source (1-2); level of the external reference signal (7-8 and, eventually, 10-11); level of the auxiliary voltage source (13-14); level of the potentiometer reference signal (9-14 and, eventually, 12-14); level of current to the solenoids, according to the relation 1V=2A, can be measured with a voltmeter :

for channel "A" between 2 ("0") and 4 (MA-)

for channel "B" between 2 ("0") and 6 (MB-)

CALIBRATION PROCEDURES FOR STANDARD DRIVERS TYPE UED-M15-**

A) UED-M15-01 = channel "A"

B) UED-M15-05 = channels "A" and "B" for 2- solenoid valves

1) UED-M15-** universal electronic drivers are "factory set" at the following values:

1.1) Limit "A" (and Limit "B"):
max current on channel "A" is limited at 2,5A (max current on channel "B" is limited at 2,5 A).

1.2) Switching: Dither frequency is set at 110 Hz

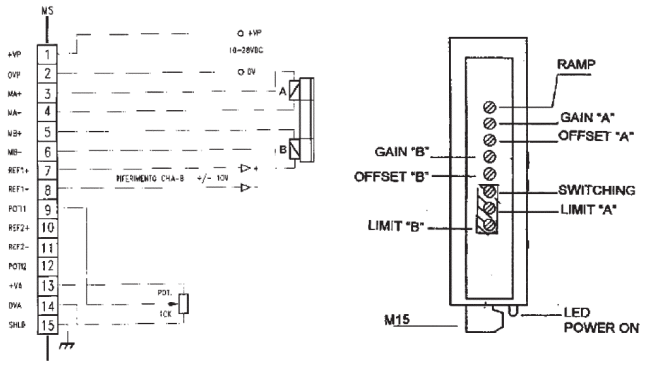
1.3) GAIN "A" (and GAIN "B"):
adjusted to give on channel "A" current of 2,5 A with 100% reference signal (similar adjustement of channel "B")
Note: 100% reference for channel "A" is 0→+10V on terminal 7/8 (GAIN of 0,25 A/V) or 2,5→5V on terminal 9/14 if given by a 10 KΩ potentiometer (gain of 1A/V)

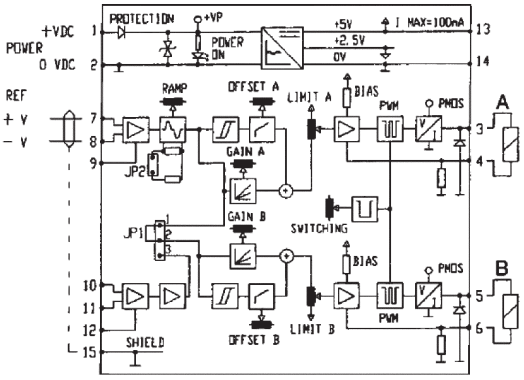
1.4) Bias current " A" (and Bias current "B"): not adjustable, fixed at 50 mA (to keep the solenoid magnetic field)

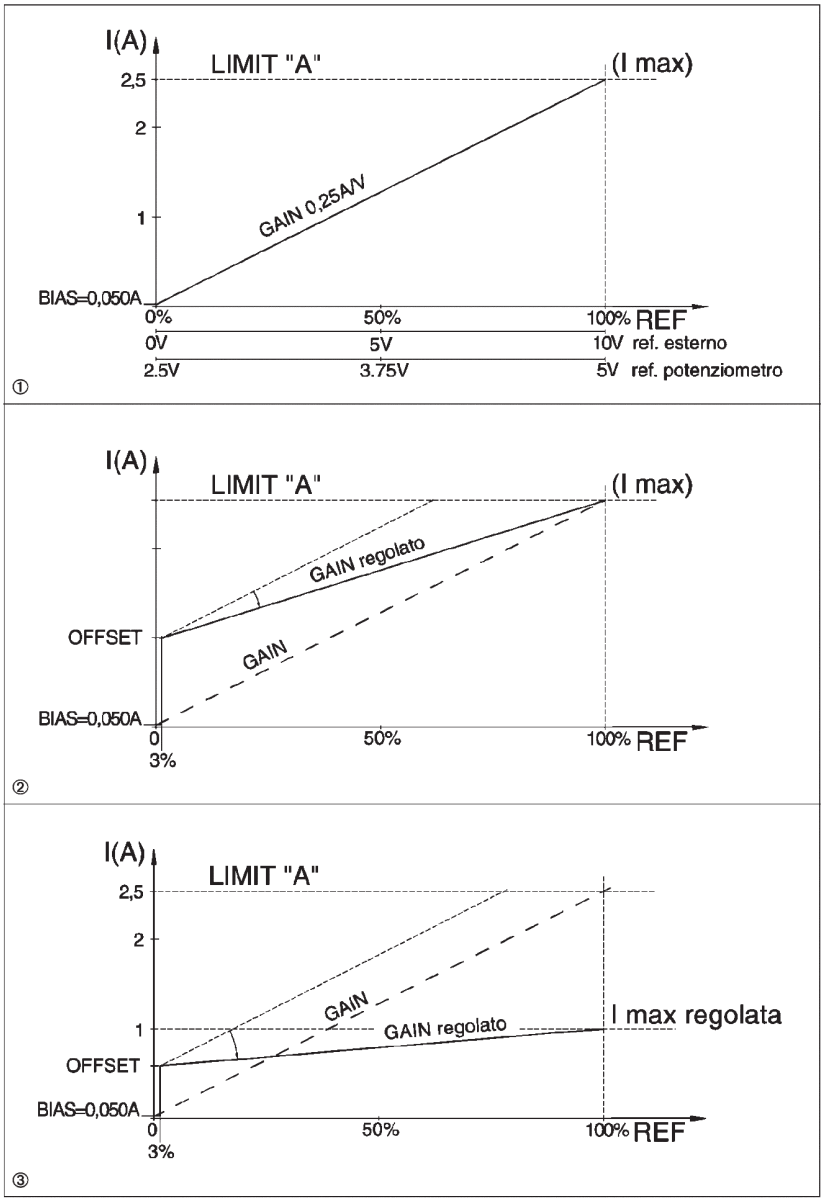
1.5) Offset "A" (and Offset "B"): set at "zero"

1.6) Ramp: set at minimum value (0,02 sec)
These conditions are shown in diagram ①

UED-M15-05
FOR BISOLENOID PROPORTIONAL VALVES
connections and adjustements







2) Calibration:

2.1) The following parameters normally should not be adjusted:

2.1.1) Limit "A" (and Limit "B"): can be changed by operating the one turn, sealed potentiometer.
By clock wise rotation, current is increased (from 0,5 A to 4 A) giving a new limit value.

2.1.2) Switching: can be changed by operating the one turn, sealed potentiometer.
By clock wise rotation the Dither frequency is increased (from 50 Hz to 420 Hz)

2.2) The following parameters normally must be adjusted

2.2.1) Offset "A" (and Offset "B").
This is the current needed to have the required prompt "reaction" of the valve when the reference signal changes around its 0% value, thus reducing the effects of spool overlapping, spring resistance, etc...
This current is adjusted by multiturn potentiometer; by clock wise rotation the offset current is increased (from 0% to 50% of limit current).
Offset current is always in addition to the 50 m A bias current and it is "triggered" when the reference signal overcomes 3% of the full reference signal (300 mV with reference 0 →10V or 150 mV with reference 2,5 V→V from potentiometer).
When reference signal is at 0%, the offset current does not flow and the valve is stabilized at its rest position.

2.2.2) Gain "A" (and Gain "B"): this gives the "Scale" of the channel, that is how much the current increases (or decreases) for a given variation of the reference signal: factory set is at 0,25A/V with reference 0→10V (or 1A/V with reference 2,5V→5V from potentiometer).
The Gain is adjusted by multiturn potentiometer; by clockwise rotation the Gain is increased.
The effects of those adjustements are shown in diagram ②.

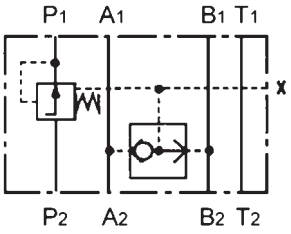
This calibration of the electronic driver gives the best conditions for scale sensitivity, proptness etc... when the current I max required by the valve is coincident with, or close to, limit "A" (2,5 A).
In the case that the valve requires a max current value which is lower than limit "A" (example: I max = 1A) and it is important to save a good sensitivity of scale, the suggested procedure is shown on diagram ③; where first is made the offset calibration and then the gain adjustement , to have the required I max (adjusted) when 100% of the reference signal is applied.

2.2.3) Ramp: gives a slope current response to a step change of the reference signal. Ramp is active (up and down) on channel "A" of UED-M15-01 and -11; on both channels "A" and "B" of UED-M15-05 .
Ramp is adjusted by one turn potentiometer; by clock wise rotation ramp time is increased from 0.02 sec to 5 sec. for a 100% step change of the reference signal (or from 0,01 sec to 1 sec for version "R").

ISO 03 HYDRAULIC STACKABLE VALVES type AM3-PC
2-WAY PRESSURE COMPENSATOR

- Direct acting 2-way pressure compensator
- **ISO 03** interface, stackable assembly
- Max operating pressure : 320 bar
- Max recommended flow: 32 l/min
- Pressure compensator Δp: 10bar
- Mass: 1,1 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt

SYMBOL



Available on request with single flow control on A or on B

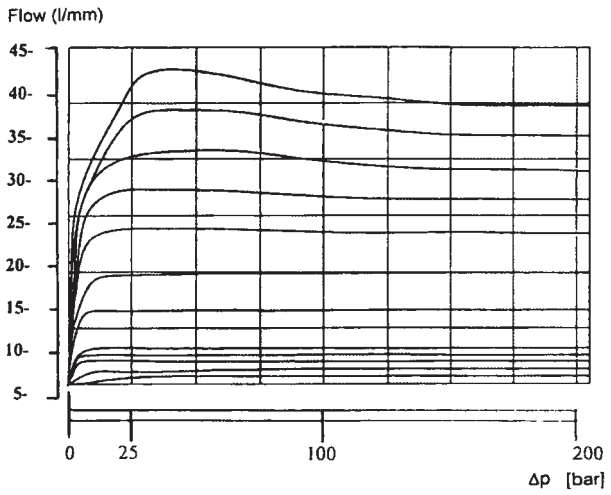
ORDERING CODE

AM3 – PC – P

AM3	ISO 03 stackable valve
PC	2-way pressure compensator valve
P	Control on port P with A or B selection

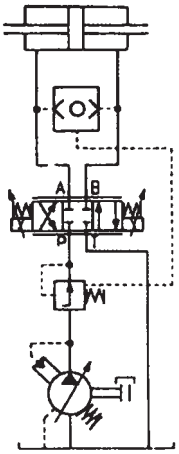
TYPICAL DIAGRAM

Typical Δp-Q curves for valves AM3-PC-P, with mineral oil at 36cSt and 50°C



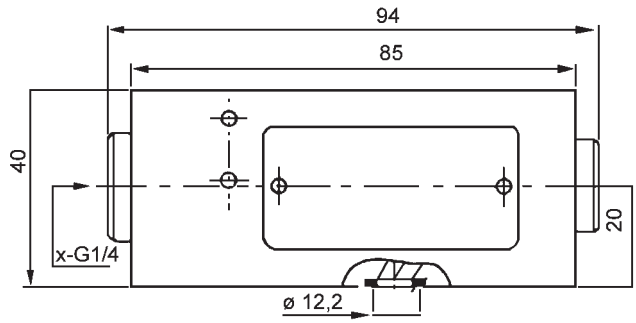
Typical curves reporting maintaining of set Δp in function of excess flow through T line.
Curves refer to 4 different set values of Δp and 2 different working pressures.

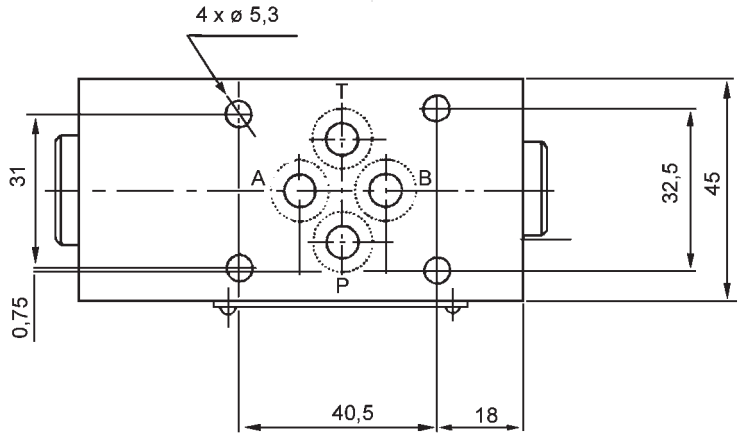
CIRCUIT DIAGRAM



The valve maintains a constant pressure difference across the metering edge of the proportional direction valve. So the pressure variation due to loading changes, as well as pump pressure changes, are compensated. That means that an increase in pump pressure cannot result in any flow increase. Provided that there is no preloading of the outlet port, the use of a meter-in pressure compensator is limited only to drives with exclusively positive load direction.

OVERALL DIMENSIONS

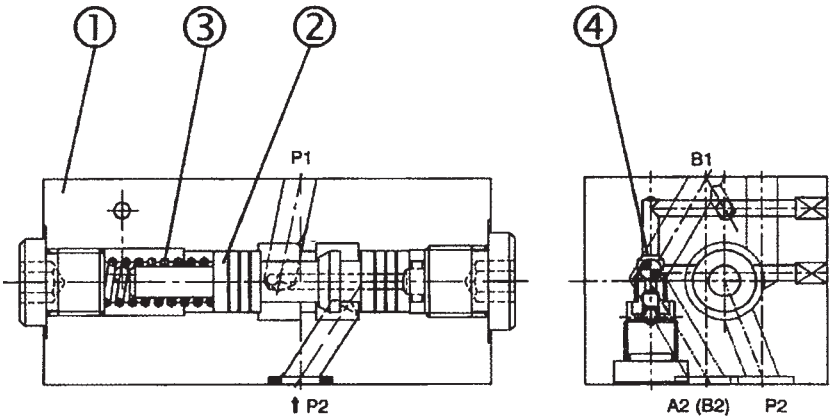




Subject to technical and dimensional changes without notice

TYPICAL SECTION

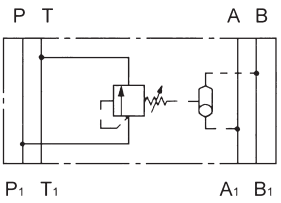
1	Body	3	Spring
2	Control spool	4	Shuttle valve



ISO 03 HYDRAULIC STACKABLE VALVES type AM3-LS
3-WAY PRESSURE COMPENSATOR - LOAD SENSING

- Pilot operated 3-way pressure compensator
- Load sensing feature
- **ISO 03** interface, stackable assembly
- Adjustable Δp (from 5 to 40 bar) by screw
- Max operating pressure : 320 bar
- Max recommended flow: 40 l/min
- Mass: 1,5 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



Available on request with single flow control on A or on B

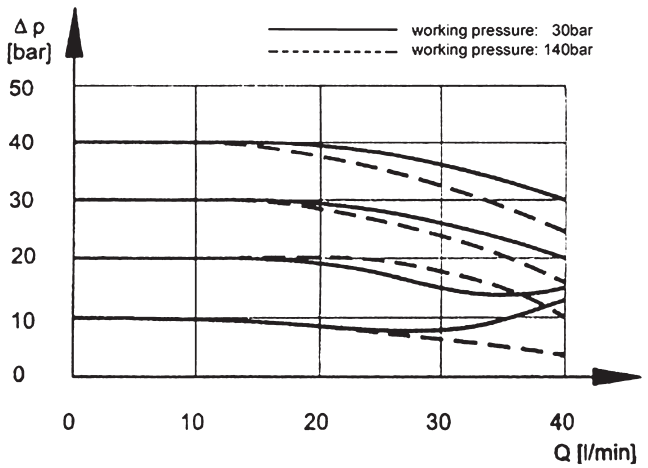
ORDERING CODE

AM3-LS-P3

AM3	ISO 03 stackable valve
LS	Load sensing compensator, Δp adjustable from 5 to 40bar
P	Control on port P with A or B selection of pilot pressure
3	3-way pressure compensator

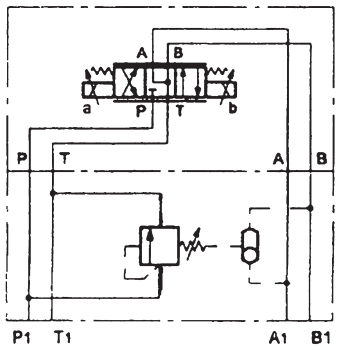
TYPICAL DIAGRAM

Typical Δp-Q curves for valves AM3-LS, with mineral oil at 36cSt and 50°C



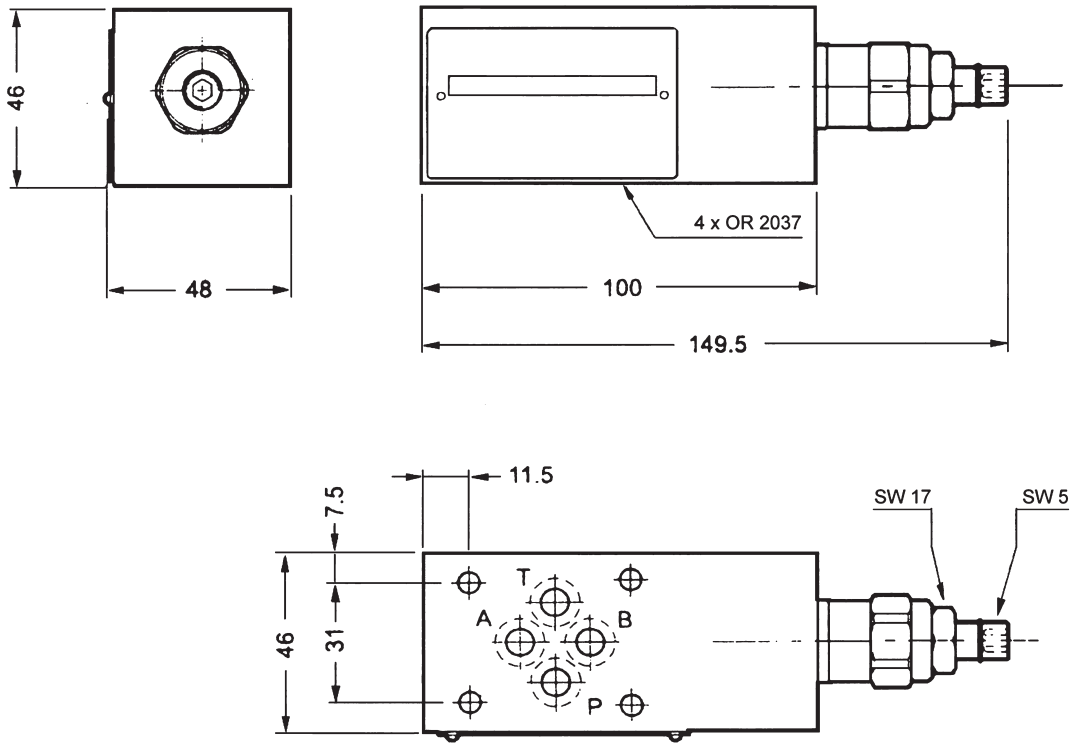
Typical curves reporting maintaining of set Δp in function of excess flow through T line.
Curves refer to 4 different set values of Δp and 2 different working pressures.

CIRCUIT DIAGRAM



The excess flow is unloaded on T port at a pressure value equivalent to working pressure added to the set Δp, with result of compensating changes on load and saving energy.

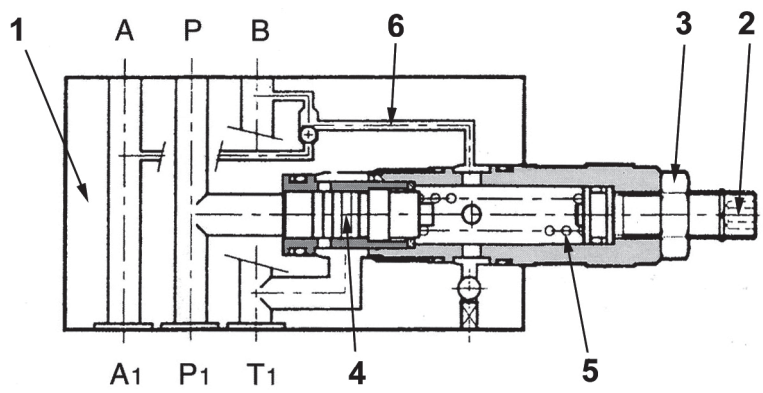
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

1	Body	4	Regulating spool
2	Set screw	5	Spring
3	Locking nut	6	Load sensing pilot line



ISO 02 HYDRAULIC VALVES type HD2-LO
DIRECTIONAL CONTROL - MANUALLY OPERATED

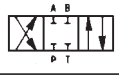
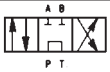
- 4-way manually operated directional valves
- **ISO 02** interface
- Maximum flow rate: 30 l/min
- Maximum pressure (port P-A-B): 320bar
- Maximum pressure (port T): 100bar
- Mass: 1,0 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

ORDERING CODE

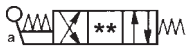
HD2 – LO – 4 C

HD2	ISO 02 4-way directional control valve
LO	Manually operated
4	Spool type **(see table)**
C	Drive arrangement **(see table)**

SPOOL TYPE **

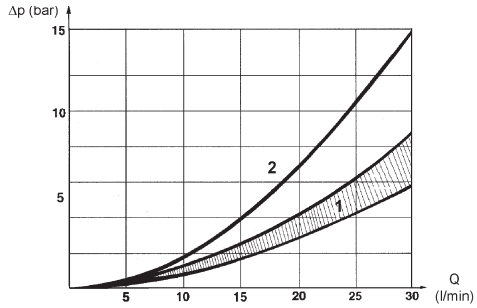
1	
3	
4	

DRIVE ARRANGEMENT

C	
N	
LL	
D	

ORDERING CODE

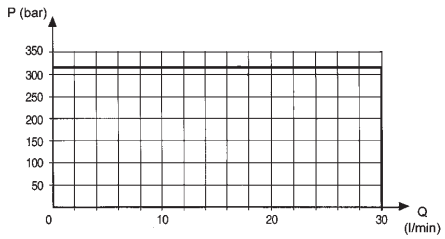
Typical Δ p-Q curves for valves HD2-LO in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T



1) All spools P→A,B and A,B→T. Spool 4 P→T.

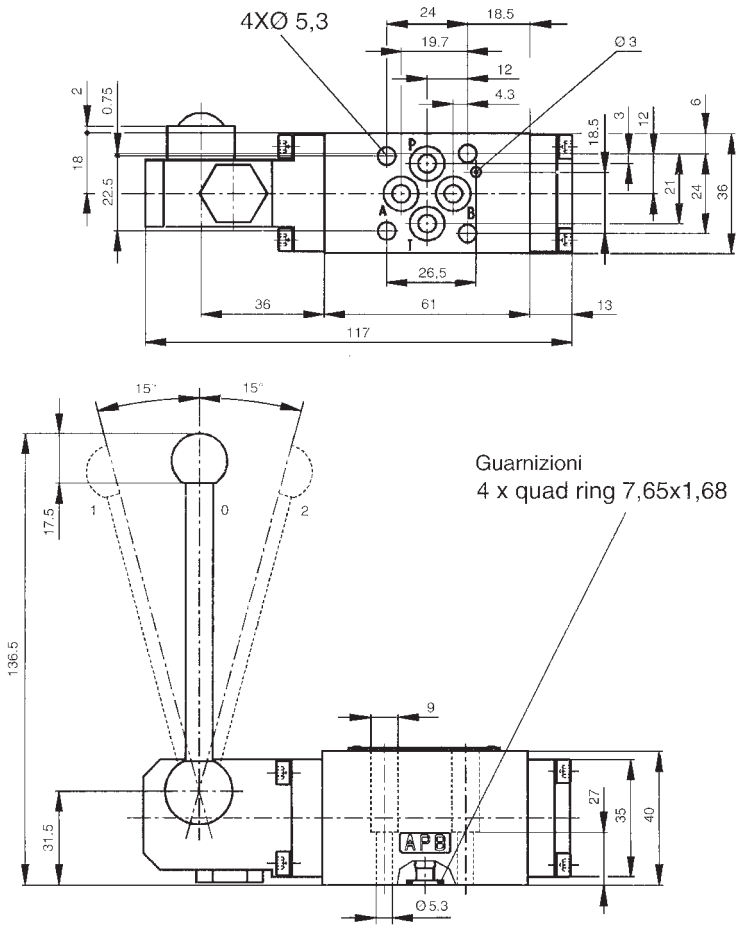
2) Spool 4 P→A,B and A,B→T

Typical p-Q curves of operating limits for maximum hydraulic power transferred by valves HD2-LO



All spools

OVERALL DIMENSIONS

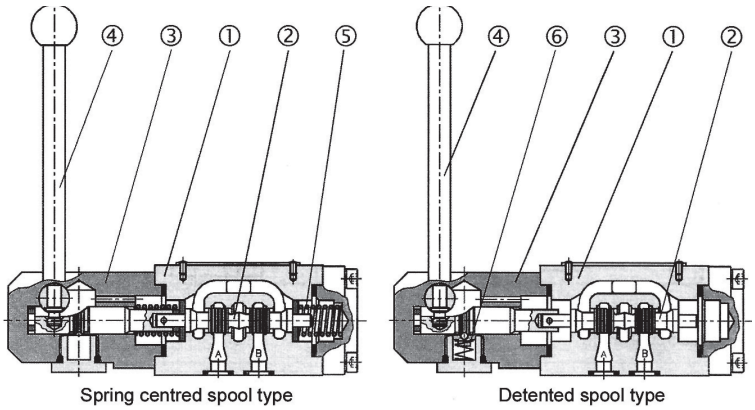


Fixing bolts: n.4 M5 x 35 (not included) – Tightening torque 5Nm

Subject to technical and dimensional changes without notice

TYPICAL SECTION

1	Body	4	Acting lever
2	Spool	5	Spring
3	Actuator body	6	Detent



Spring centred spool type

Detented spool type

ISO 03 HYDRAULIC VALVES type HD3-LO
DIRECTIONAL CONTROL - MANUALLY OPERATED

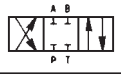
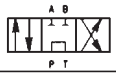
- 4-way manually operated directional valves
- **ISO 03** interface
- Maximum flow rate: 80 l/min
- Maximum pressure (port P-A-B): 320bar
- Maximum pressure (port T): 100bar
- Mass: 1,6 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

ORDERING CODE

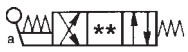
HD3 – LO – 1 C

HD3	ISO 03 4-way directional control valve
LO	Manually operated
1	Spool type **(see table)**
C	Drive arrangement **(see table)**

SPOOL TYPE **

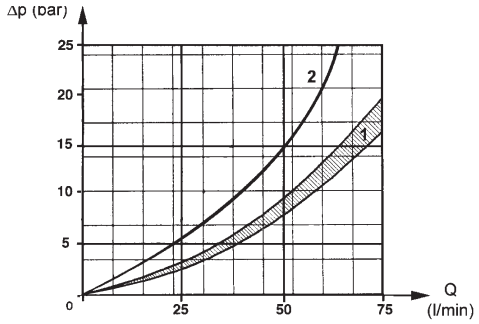
1	
3	
4	

DRIVE ARRANGEMENT

C	
N	
LL	
D	

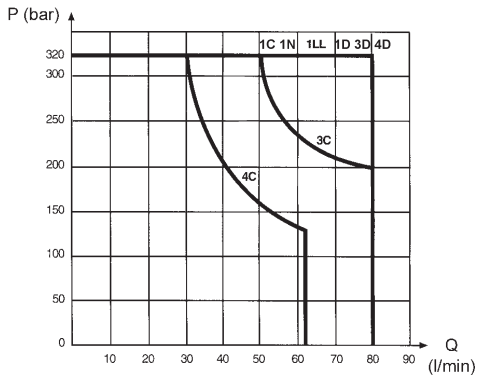
ORDERING CODE

Typical Δ p-Q curves for valves HD3-LO in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T

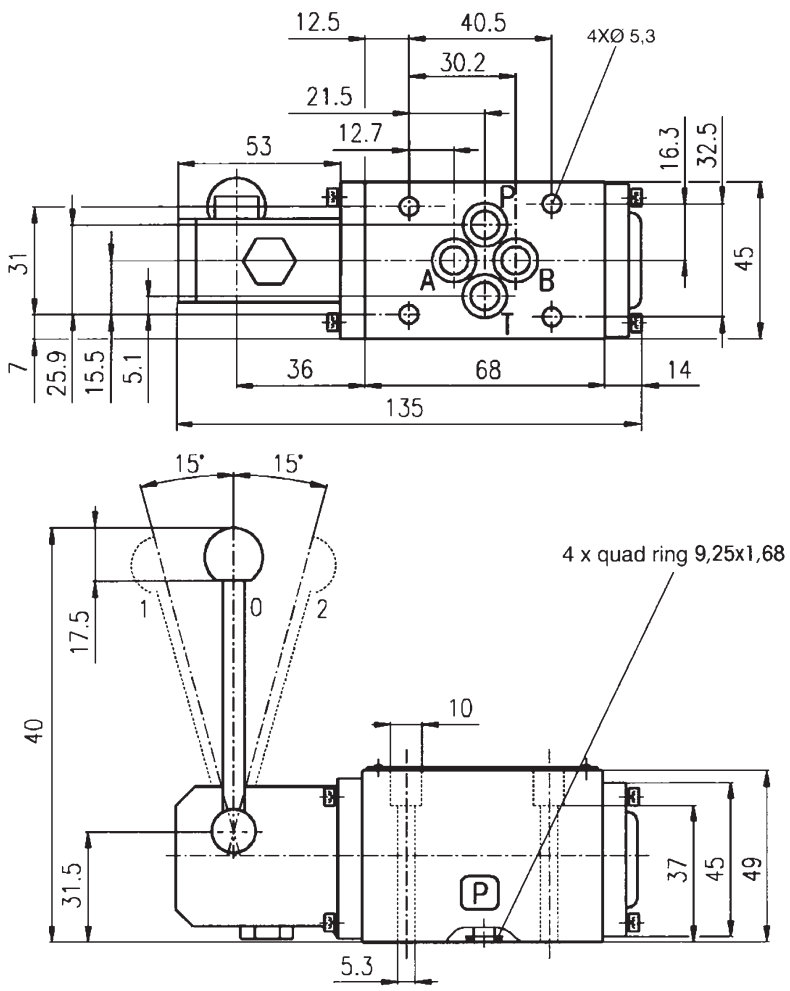


1) All spools P→A,B and A,B→T. Spool 4 P→T.
2) Spool 4 P→A,B and A,B→T

Typical p-Q curves of operating limits for maximum hydraulic power transferred by valves HD3-LO



OVERALL DIMENSIONS

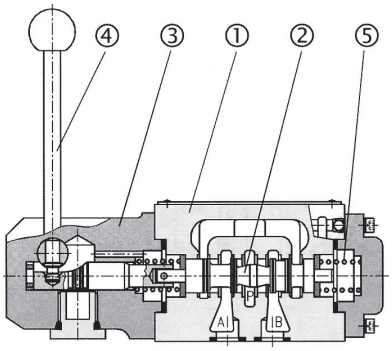


Fixing bolts: n.4 M5 x 45 (not included) – Tightening torque 9Nm

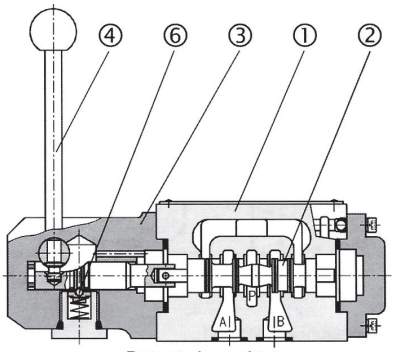
Subject to technical and dimensional changes without notice

TYPICAL SECTION

1	Body	4	Acting lever
2	Spool	5	Spring
3	Actuator body	6	Detent



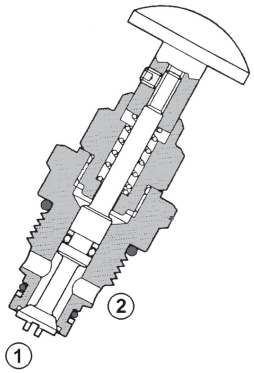
Spring centred spool type



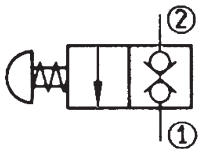
Detented spool type

HYDRAULIC SCREW-IN VALVES type VEM-34
N.C. 1-DIR. FLOW – MANUALLY OPERATED

- Suitable for standard cavity **3/4" 16 UNF**
- **2-way manually** operated poppet valves
- **Normally closed**, one direction flow
- Stroke adjustment by rotation of the knob to the desired position. A set screw will fix the new position
- Maximum operating pressure: 350 bar
- Maximum recommended flow rate: 20 l/min
- Operating temperature: -30°C +50°C
- Steel body zinc plated
- Poppet in hardened and grinded steel
- Mass 0,13 kg



SYMBOL



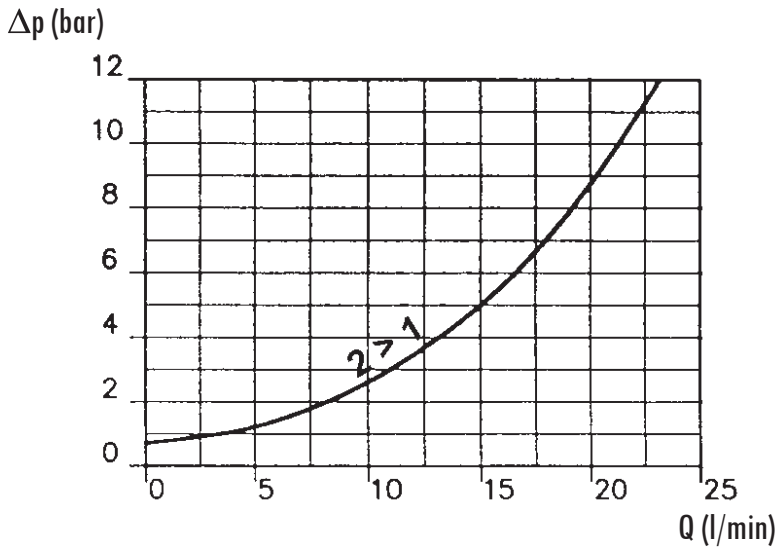
ORDERING CODE

VEM-34-NC/20

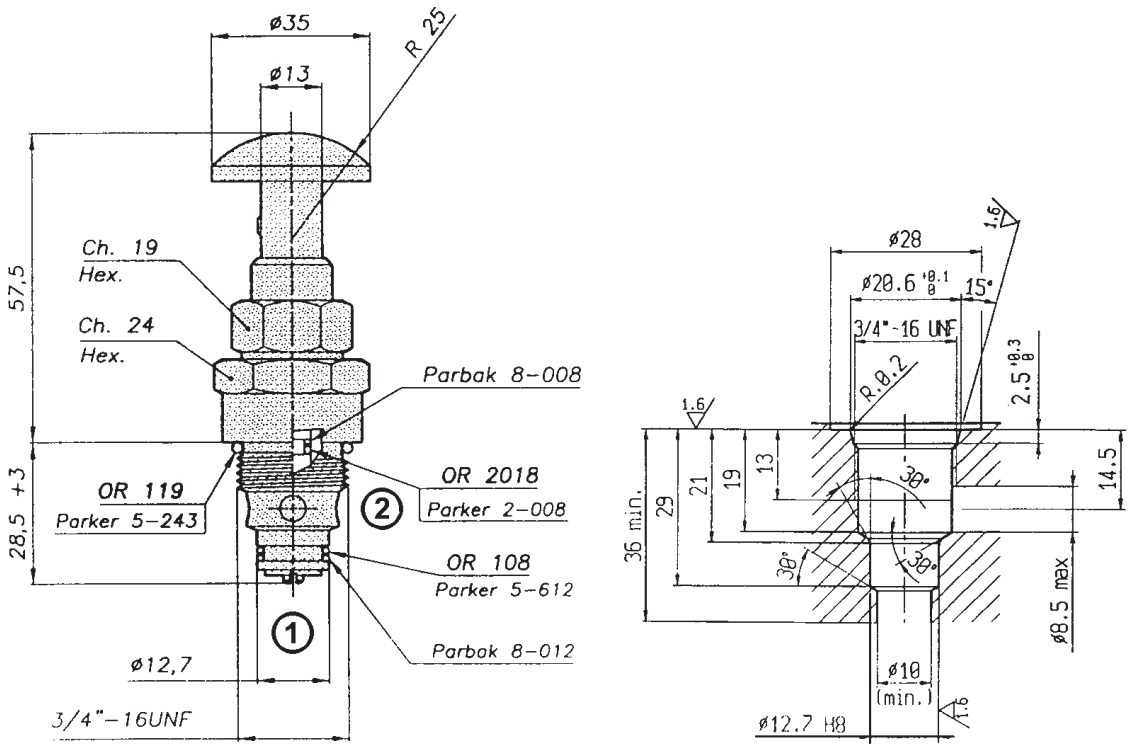
VEM	2-way manually operated poppet valve
34	Size 3/4" – 16 UNF
NC	Normally closed
20	Drawing

TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **VEM.34** in standard configuration, with mineral oil at 42cSt and 50°C for flow 2 → 1

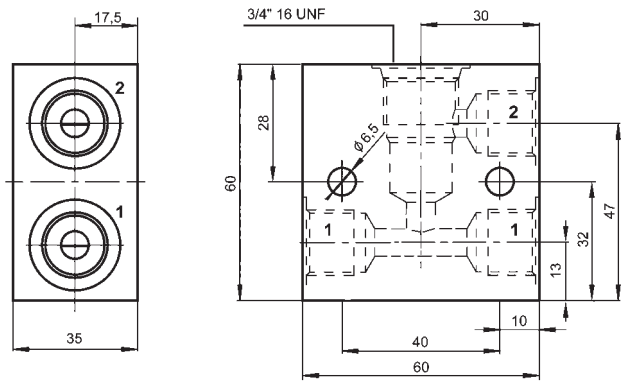


OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

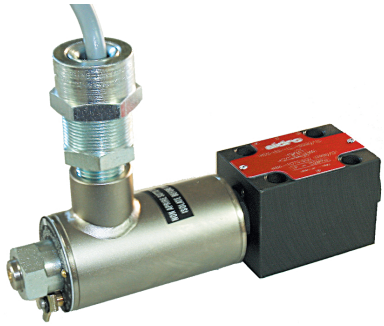


Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

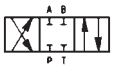
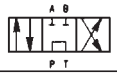
Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

ISO 03 HYDRAULIC VALVES type HD3-EX
EX-PROOF SOLENOID OPERATED – ATEX

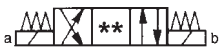
- 4-way Ex-proof solenoid operated valves
- **ISO 03** interface, directional control
- Solenoids according to ATEX 94/9/CE
- **ATEX code/class: CE 0722 / Ex II 2 G EEx d II C T5**
- Certificate: CESI 03 ATEX 212 (on request)
- Maximum flow rate: 40 l/min
- Maximum pressure (all ports): 250bar
- 100% duty cycle
- Emergency pin for manual override
- Mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt



SPOOL TYPE **

0	
1	
3	
4	

DRIVE ARRANGEMENT

C	
N	
LL	
ML	

ORDERING CODE

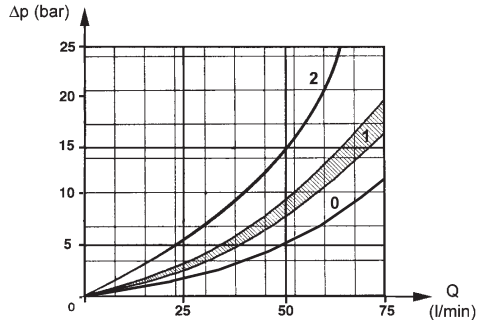
HD3 – EX – 1LL – * – 024C

HD3	ISO 03 4-way directional control valve
EX	Electrically controlled, Ex-proof solenoids
1	Spool type **(see table)**
LL	Drive arrangement **(see table)**
*	b: only for versions LL, ML, LM solenoid "b"
COILS	Type GMA-6/HD – Nominal absorption: 11W
Current data	012C: 12V DC-0,92A 024C: 24V DC-0,46A 115A: 115V AC-0,10A 230A: 230V AC-0,05A
Protection	According to IEC144: class IP67 – External surfaces nickel coated (min. thickness 7 micron)

Connection: 3 x 1,5mm² x 1,5m wire cable (CEI 20-22), already connected to coil. Earth connection internal, with yellow-green wire in the cable, and external with a min. 4mm² cable fastened to earth screw.

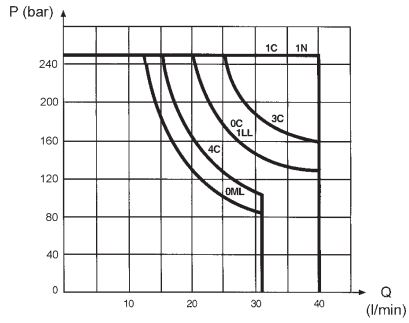
TYPICAL DIAGRAMS

Typical Δp-Q curves for valves HD3-EX in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T



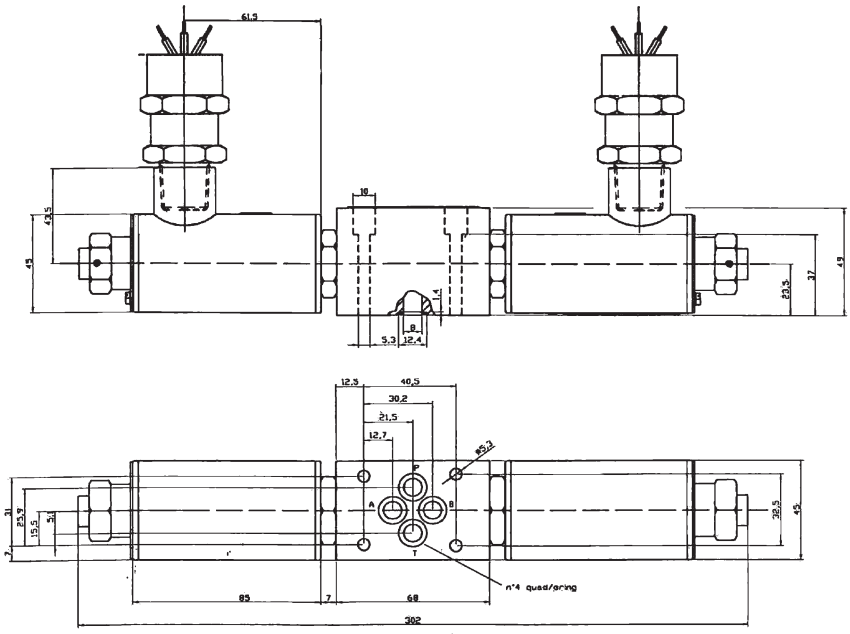
0) Spool 0 P→A,B and A,B→T
1) All spools P→A,B and A,B→T. Spool 4 P→T.
2) Spool 4 P→A,B and A,B→T

Typical p-Q curves of operating limits for maximum hydraulic power transferred by valves HD3-EX

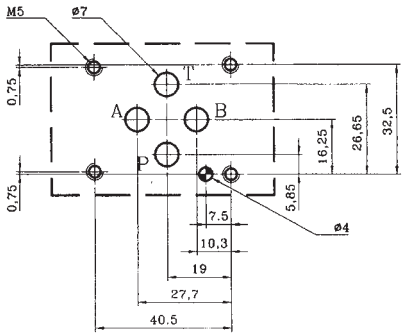


Input voltage 5% less than nominal rate

OVERALL DIMENSIONS



ISO 03 Interface

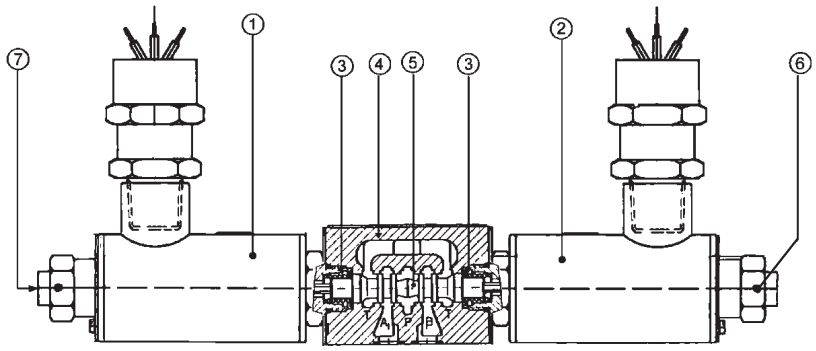


Fixing bolts: n.4 M5 x 45 (not included)
Tightening torque: 8Nm
Valve mass: 2,60kg (with 1 coil) – 3,70kg (with 2 coils)

Subject to technical and dimensional changes without notice

TYPICAL SECTION

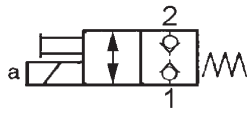
1-2	Solenoids according to ATEX 94/9/CE	5	Spool
3	Springs	6	Ring nut
4	Body	7	Emergency pin



HYDRAULIC SCREW-IN VALVES type EVX-06-C5
EX-PROOF SOLENOID OPERATED – ATEX

- Suitable for standard cavity **M22**
- Ex-proof solenoid operated **2-way** poppet valve, (zero drops)
- Solenoids according to ATEX 94/9/CE
- **ATEX code/class: CE 0722 / Ex II 2 G EEx d II C T5**
- Certificate: CESI 03 ATEX 212 (on request)
- Normally closed, bi-directional control
- Maximum operating pressure: 250bar
- Maximum flow rate: 25 l/min
- 100% duty cycle
- Steel body, poppet in hardened and grinded steel
- Mass 1,40kg (coil included)

SYMBOL



ORDERING CODE

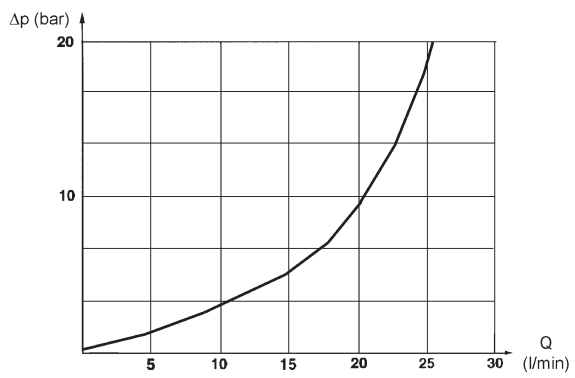
EVX-06-C5-*	
EVX	Ex-proof solenoid operated screw-in poppet valve
06	Normal port size
C5	Type

ORDERING CODE

COIL	Type GMA-6/EV – Nominal absorption: 11W
Current data (*)	012C: 12V DC-0,92A 024C: 24V DC-0,46A 115A: 115V AC-0,10A 230A: 230V AC-0,05A
Protection	According to IEC144: class IP67 – External surfaces nickel coated (min. thickness 7 micron)
Connection	3x1,5mm² wire cable (CEI 20-22), length 1,5m already connected to coil. Electrical connection must be accordance to Exproof norm ATEX. Earth connection both internal, with yellow-green wire in the cable, and external with a minimum 4mm² cable fastened to earth screw.

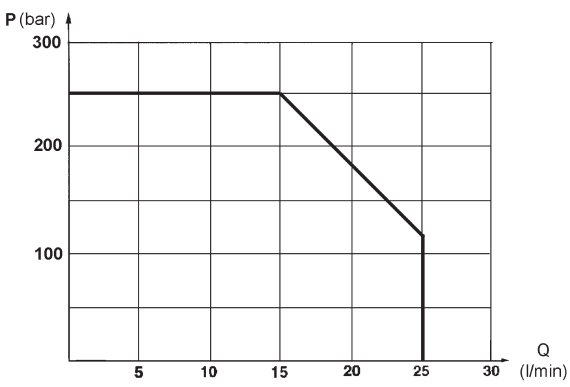
TYPICAL DIAGRAM

Typical Δ p-Q curves for valves EVX-06-C5 in standard configuration, with mineral oil at 26cSt and 50°C.



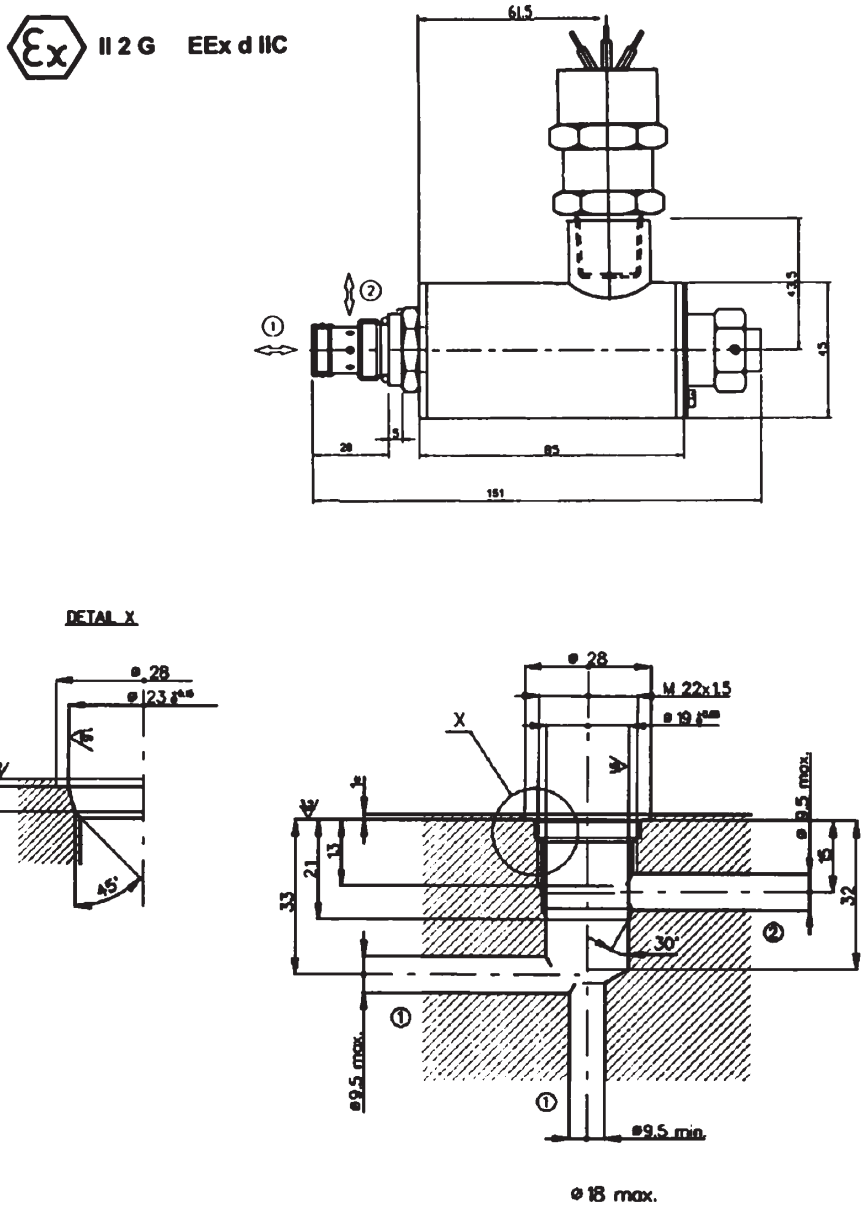
Flow: 1→2 and 2→1

Typical p-Q curves of operating limits for maximum hydraulic power transferred by valves EVX-06-C5



Input voltage 10% less than nominal rate

OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

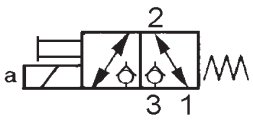
LINE ASSEMBLY BODY

Non-Standard.
Available on request

HYDRAULIC SCREW-IN VALVES type EVX-06-D5
EX-PROOF SOLENOID OPERATED – ATEX

- Suitable for standard cavity **M22**
- Ex-proof solenoid operated poppet valve
- 3-way valve, zero drops
- Solenoids according to ATEX 94/9/CE
- **ATEX code/class: CE 0722 / Ex II 2 G EEx d II C T5**
- Certificate: CESI 03 ATEX 212 (on request)
- Maximum operating pressure: 250bar
- Maximum flow rate: 25 l/min
- 100% duty cycle
- Steel body, poppet in hardened and grinded steel
- Mass 1,45kg (coil included)

SYMBOL



ORDERING CODE

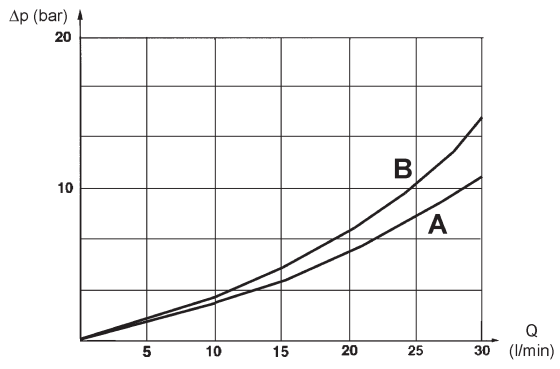
EVX-06-D5-*	
EVX	Ex-proof solenoid operated screw-in poppet valve
06	Normal port size
D5	Type

ORDERING CODE

COIL	Type GMA-6/EV – Nominal absorption: 11W
Current data (*)	012C: 12V DC-0,92A 024C: 24V DC-0,46A 115A: 115V AC-0,10A 230A: 230V AC-0,05A
Protection	According to IEC144: class IP67 – External surfaces nickel coated (min. thickness 7 micron)
Connection	3x1,5mm² wire cable (CEI 20-22), length 1,5m already connected to coil. Electrical connection must be accordance to Exproof norm ATEX. Earth connection both internal, with yellow-green wire in the cable, and external with a minimum 4mm² cable fastened to earth screw.

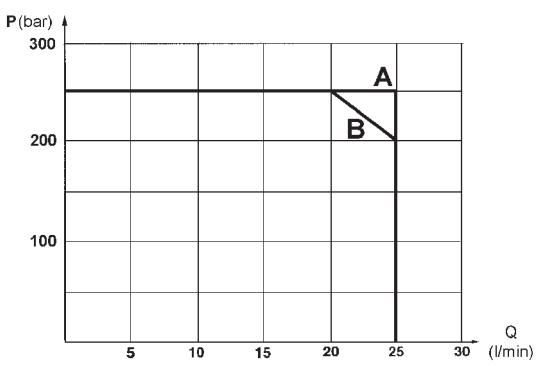
TYPICAL DIAGRAM

Typical Δp-Q curves for valves EVX-06-D5 in standard configuration, with mineral oil at 26cSt and 50°C.



A) Flow 1↔2 **B)** Flow 2↔3

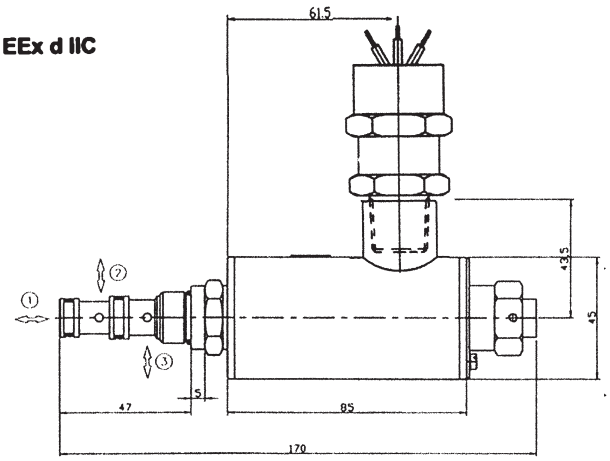
Typical p-Q curves of operating limits for maximum hydraulic power transferred by valves EVX-06-D5. Input voltage 10% less than nominal rate.

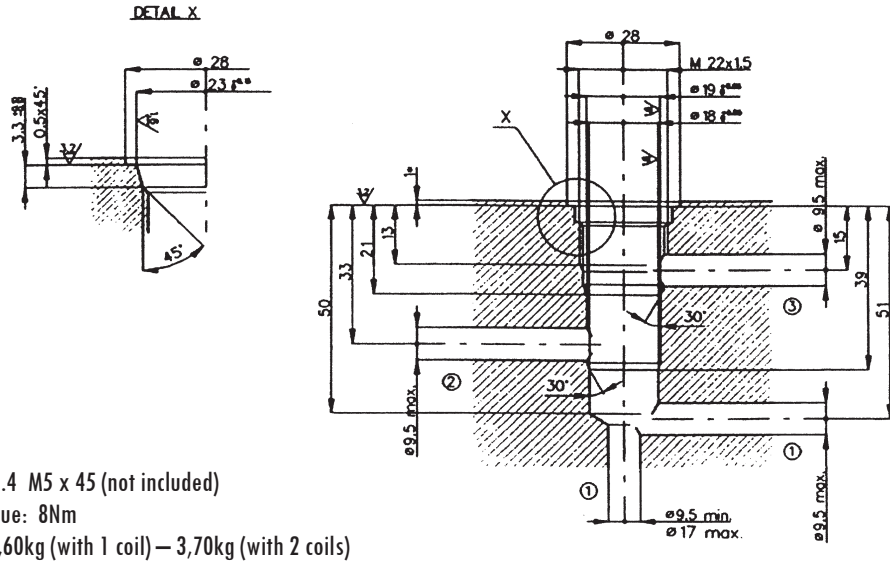


A) Flow 1→2 **B)** Flow 2↔3 and 2→1

OVERALL DIMENSIONS

II 2 G EEx d IIC





Fixing bolts: n.4 M5 x 45 (not included)
Tightening torque: 8Nm
Valve mass: 2,60kg (with 1 coil) – 3,70kg (with 2 coils)

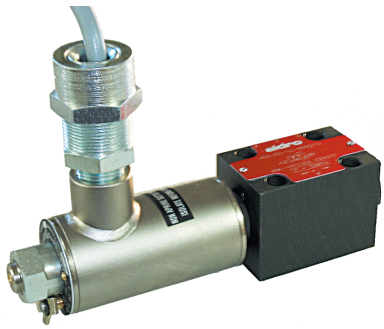
Subject to technical and dimensional changes without notice

TYPICAL SECTION

Non-Standard.
Available on request

ISO 03 PROPORTIONAL HYDRAULIC VALVES type HD3-PX
EX-PROOF SOLENOID OPERATED – ATEX

- 4-way Ex-proof solenoid valves, proportional electric control
- **ISO 03** interface, directional control
- Solenoids according to ATEX 94/9/CE
- **ATEX code/class: CE 0722 / Ex II 2 G EEx d II C T5**
- Certificate: CESI 03 ATEX 212 (on request)
- Nominal flow rate: 32 l/min with Δp=10bar
- Maximum pressure (all ports): 250bar
- Hysteresis ≤ 6%
- Emergency pin for manual override
- Mineral oil according to ISO 16/14/12 filtration class or better. Recommended viscosity range: 10 to 60cSt

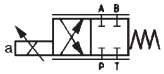
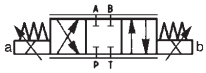


ORDERING CODE

HD3 – PX – 1PC – R4 / 10

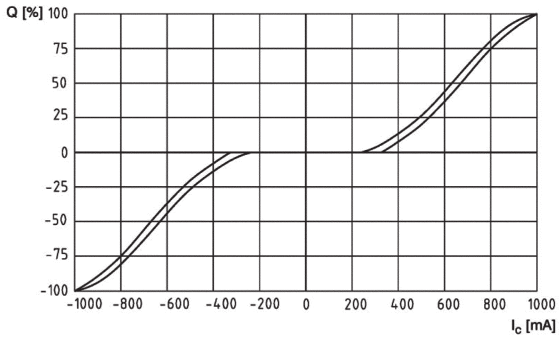
HD3	ISO 03 4-way directional control valve
PX	Proportional electric control, Ex-proof solenoids
1PC	Spool type and drive arrangement
R4	24 DC proportional solenoid - R(20°C)=13,4 Ω – IMAX=1,0A - The solenoid must be energized by an electronic driver capable of full control of min and max current value. We recommend UED-M15 type (see table ED-M15)
10	Drawing

SPOOL TYPE

1PML	
1PC	
3PC	

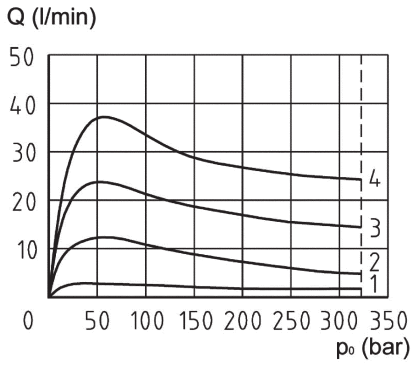
TYPICAL DIAGRAM

Flow characteristics in relation to exciting current for valves HD3-PX in standard configuration, with mineral oil at 35cSt and 50°C with Δp=10bar



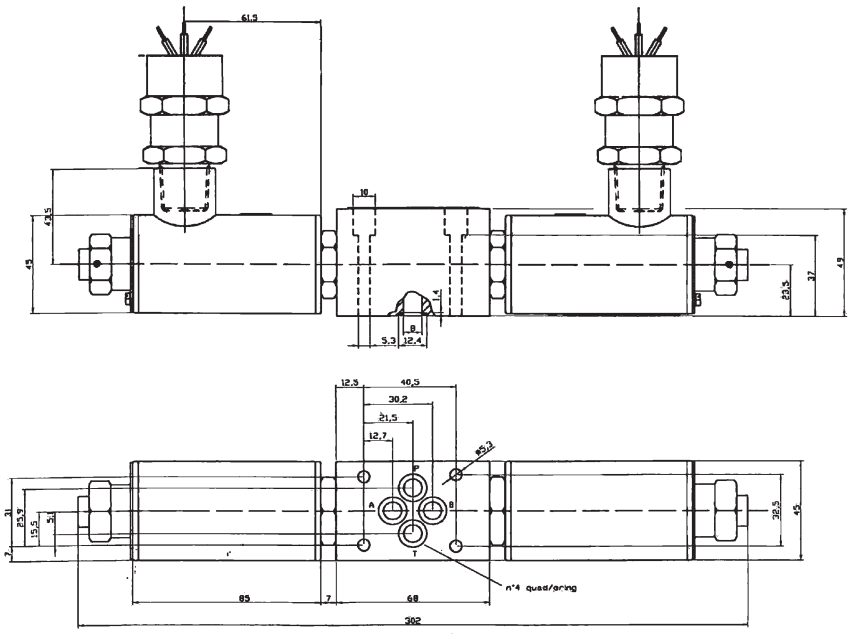
The coil current which initialise the flow through the proportional directional valve can differ with a tolerance range of ±6%

Typical p-Q curves of operating limits for HD3-PX valves at different solenoid current values, with mineral oil at 35cSt and 50°C

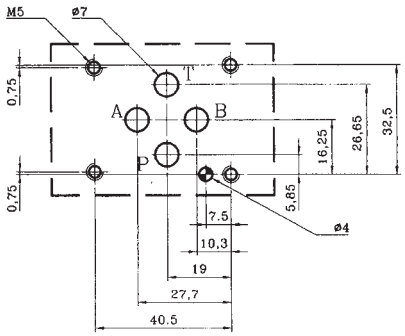


1) 40% solenoid current value 2) 60% solenoid current value
3) 80% solenoid current value 4) 100% solenoid current value

OVERALL DIMENSIONS



ISO 03 Interface

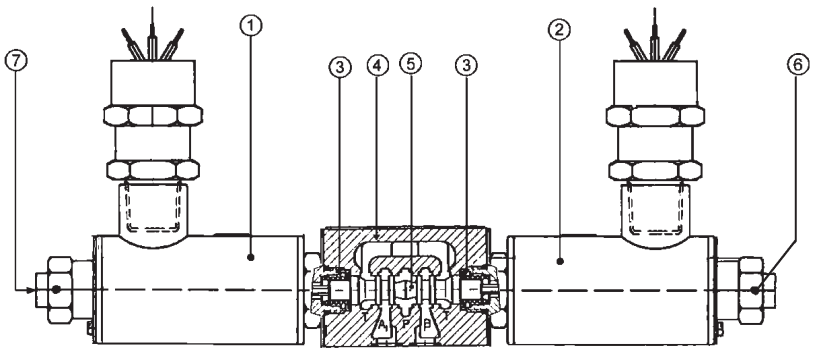


Fixing bolts: n.4 M5 x 45 (not included)
Tightening torque: 8Nm
Valve mass: 2,60kg (with 1 coil) – 3,70kg (with 2 coils)

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

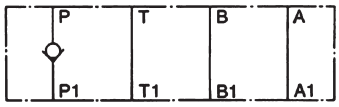
1-2	Solenoids according to ATEX 94/9/CE	5	Spool
3	Springs	6	Ring nut
4	Body	7	Emergency pin



ISO 03 HYDRAULIC STACKABLE CHECK VALVES type AM3-CO DIRECT ACTING

- Hydraulic check valves, direct acting
- **ISO 03** interface, stackable assembly
- Max operating pressure: 320 bar
- Max recommended flow: 40 l/min
- Mass: 1,0 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



Checks available on request:
on A, on B, on A and B, on P and T
(opposite directions)

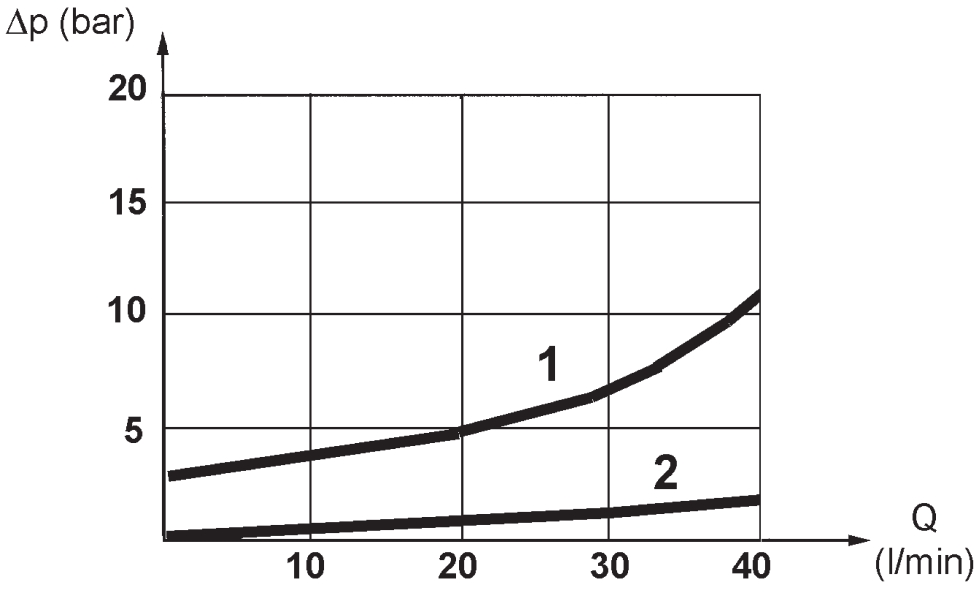
ORDERING CODE

AM3 – CO – P / 34

AM3	ISO 03 stackable valve
CO	Direct operated check valve
P	Check on P **(see symbol)** – A,B and T free
34	Drawing

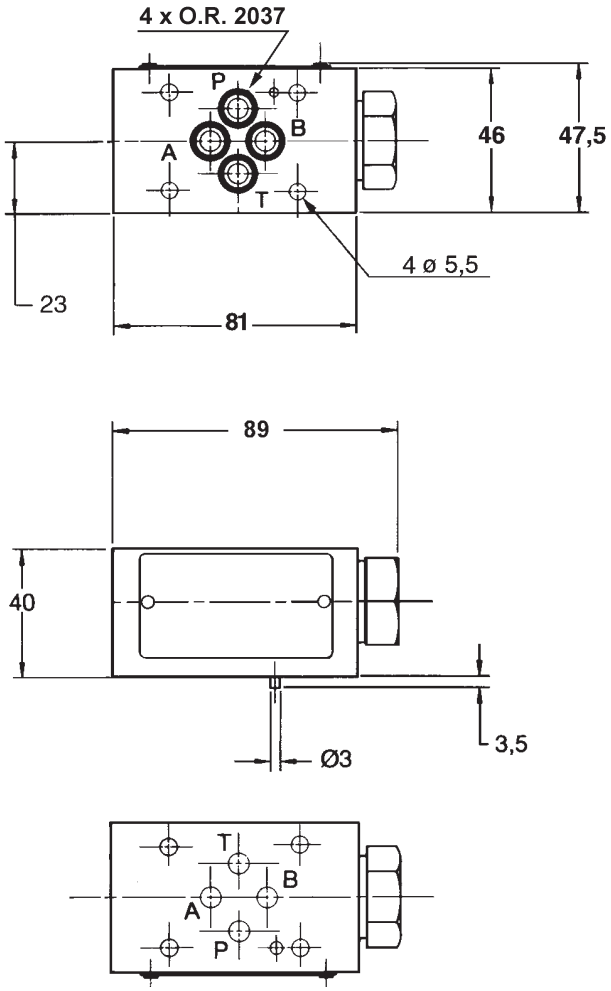
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **AM3-CO-*/20**, with mineral oil at 36cSt and 50°C for flow P1→P and free channels



1) P→ P1 (and, when checked, T1→T, A→A1, B→B1) **2)** Free channels

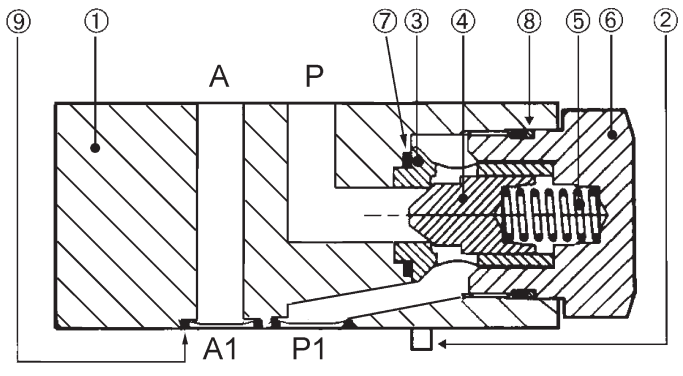
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

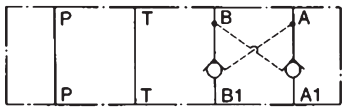
1	Body	6	Head
2	Pin	7	Seal
3	Seat	8	Seal
4	Poppet	9	Seal
5	Spring		



ISO 02 HYDRAULIC STACKABLE CHECK VALVES type AM2-CP PILOT OPERATED

- Hydraulic check valves pilot operated
- **ISO 02** interface, stackable assembly
- Pilot ratio 1: 3,5
- Max operating pressure: 320 bar
- Max recommended flow: 24 l/min
- Mass: 0,75 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



Available on request
with single pilot operated check on A or on B

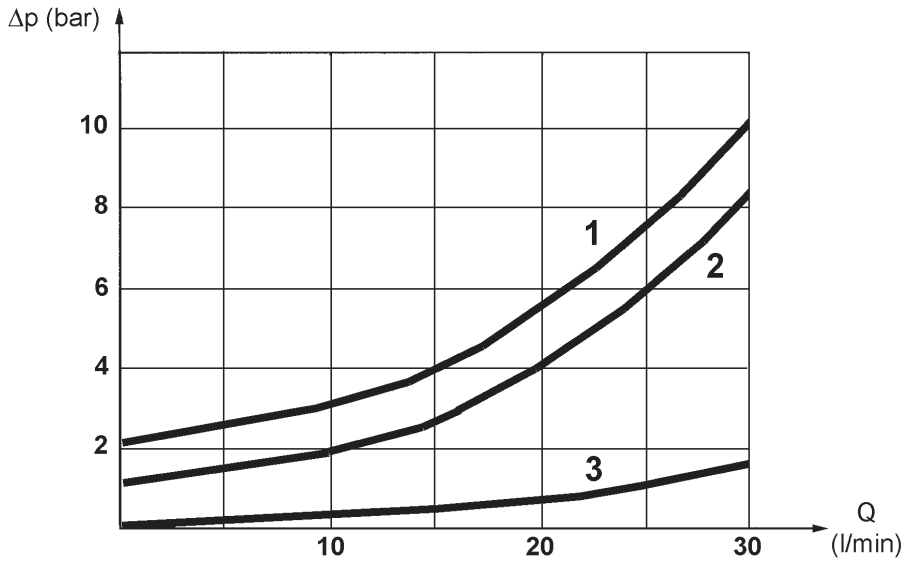
ORDERING CODE

AM2 – CP – AB

AM2	ISO 02 stackable valve
CP	Pilot operated check valve
AB	Dual check on A and B **(see symbol)** – P and T free

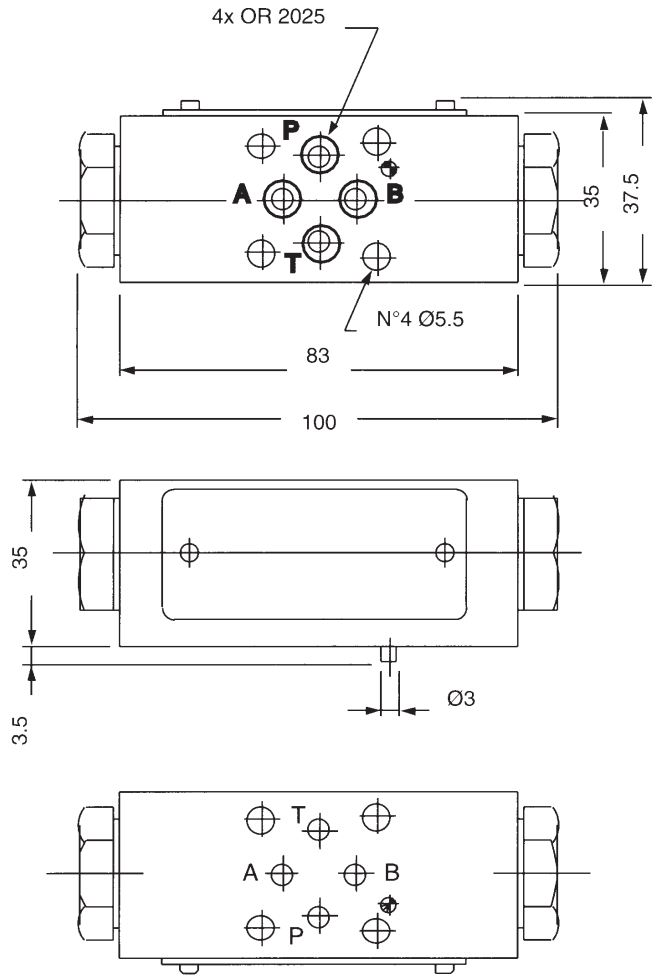
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **AM2-CP**, with mineral oil at 36cSt and 50°C for flow A1↔A, B1↔B and free channels



1) A→ A1 and B→B1 **2)** A1→A and B1→B **3)** Free channels

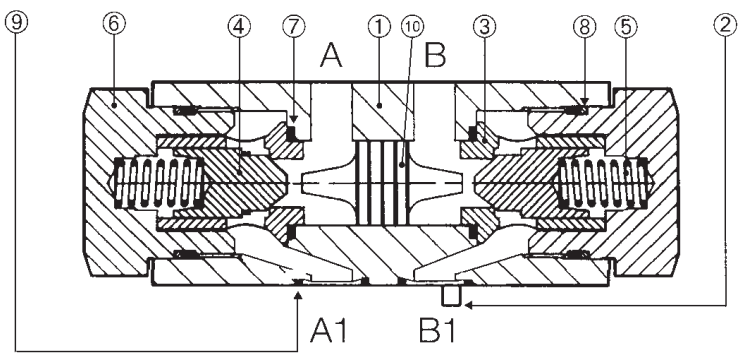
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

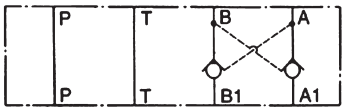
1	Body	6	Check device holder
2	Pin	7	Seal
3	Seat	8	Seal
4	Poppet	9	Seal
5	Spring	10	Pilot piston



ISO 03 HYDRAULIC STACKABLE CHECK VALVES type AM3-CP PILOT OPERATED

- Hydraulic check valves pilot operated
- **ISO 03** interface, stackable assembly
- Pilot ratio 1: 3,5
- Max operating pressure: 320 bar
- Max recommended flow: 50 l/min
- Mass: 1,0 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



Available on request
with single pilot operated check on A or on B

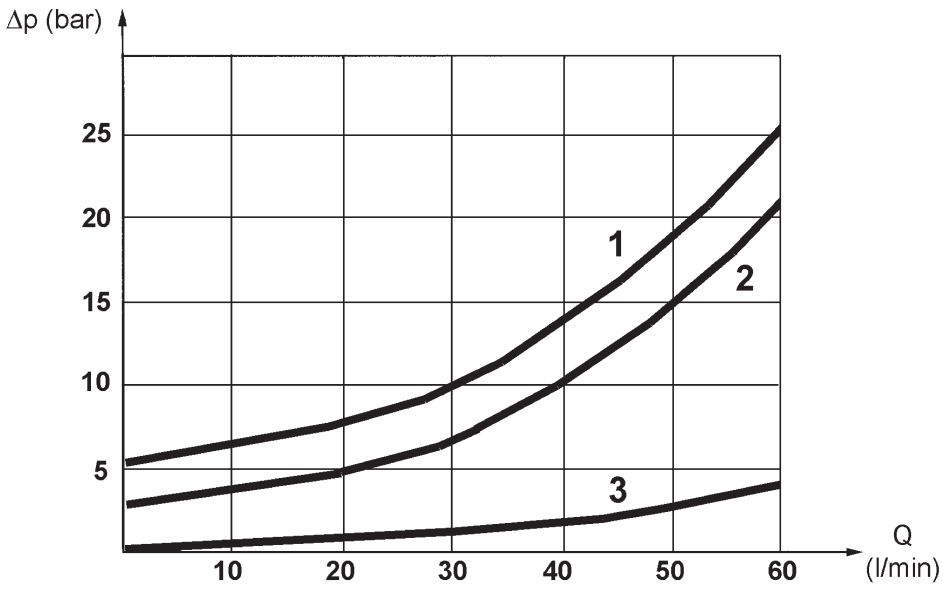
ORDERING CODE

AM3 – CP – AB

AM3	ISO 03 stackable valve
CP	Pilot operated check valve
AB	Dual check on A and B **(see symbol)** – P and T free

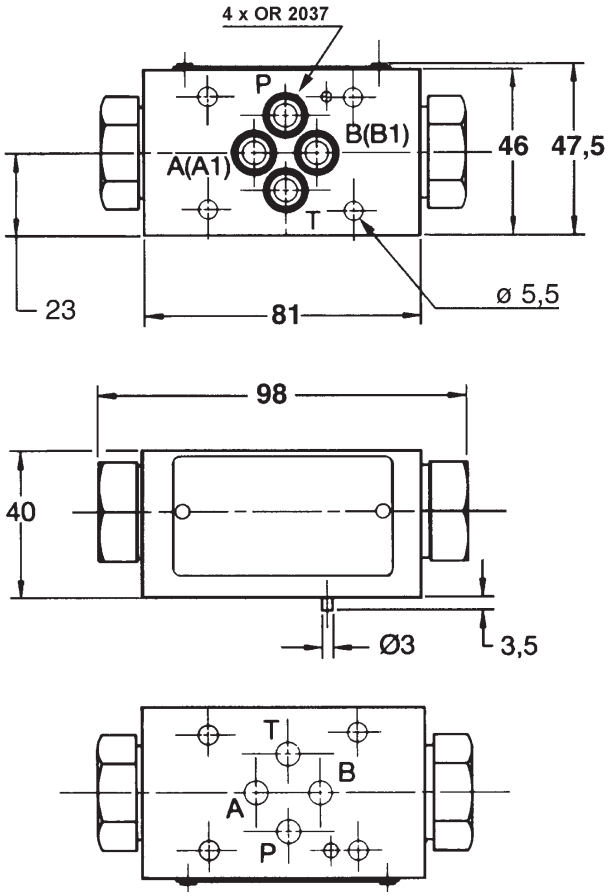
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **AM3-CP**, with mineral oil at 36cSt and 50°C for flow A1↔A, B1↔B and free channels



1) A→ A1 and B→B1 **2)** A1→A and B1→B **3)** Free channels

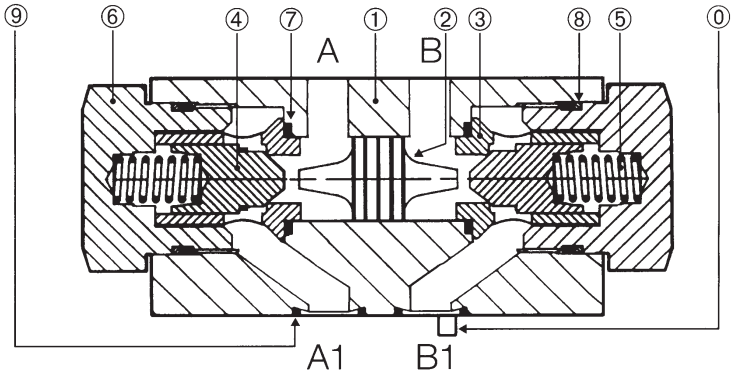
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

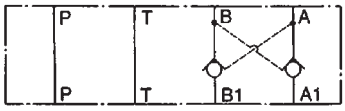
0	Pin	5	Spring
1	Body	6	Check device holder
2	Pilot piston	7	Seal
3	Bush	8	Seal
4	Poppet	9	Seal



ISO 05 HYDRAULIC STACKABLE CHECK VALVES type AM5-CP PILOT OPERATED

- Hydraulic check valves pilot operated
- **ISO 05** interface, stackable assembly
- Pilot ratio 1 : 5,6
- Decompression feature
- Max operating pressure : 320 bar
- Max recommended flow: 100 l/min
- Mass: 2,9 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



Available on request
with single pilot operated check on A or on B

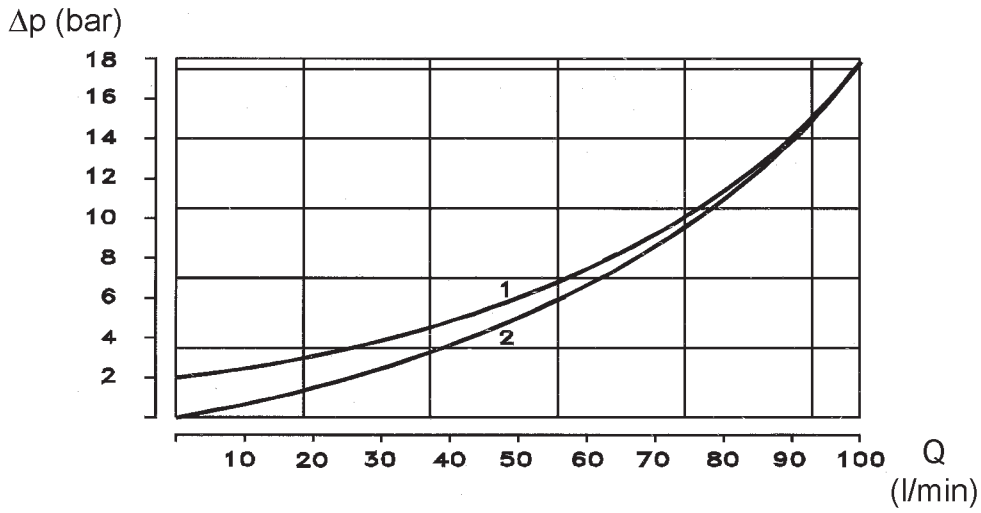
ORDERING CODE

AM5 – CP – AB

AM5	ISO 05 stackable valve
CP	Pilot operated check valve
AB	Dual check on A and B **(see symbol)** – P and

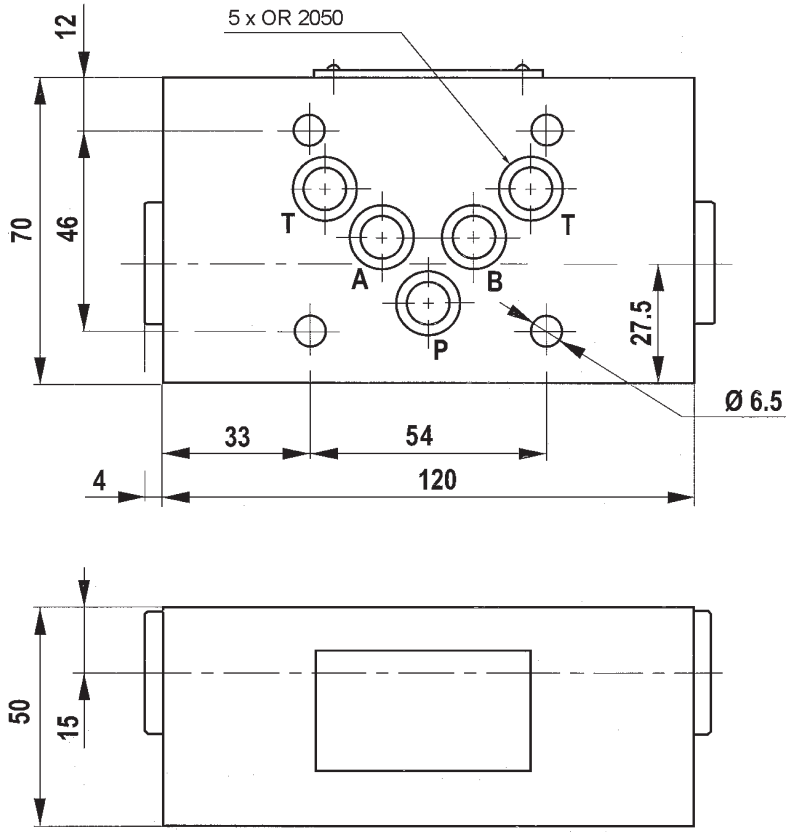
TYPICAL DIAGRAM

Typical Δ p-Q curves for valves AM5-CP, with mineral oil at 36cSt and 50°C for flow A1↔A, B1↔ B



1) A→ A1 and B→B1 **2)** A1→A and B1→B

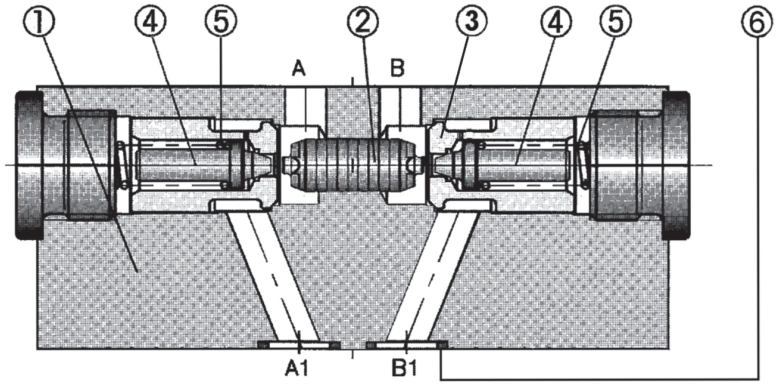
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

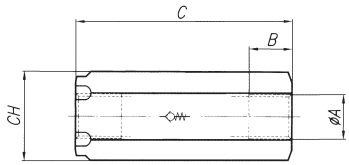
1	Body	4	Decompression poppet
2	Pilot piston	5	Spring
3	Main poppet	6	Seal



IN-LINE DIRECTIONAL CONTROL VALVES type FT

FT 257/6 CHECK VALVES

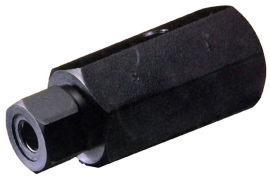
- Direct acting check valves, poppet type
- BSP thread ports for in-line assembly
- Body, poppet and spring in steel
- Maximum operating pressure: 320 bar
- Poppet release pressure: 0,35 bar (different settings available on request)
- Outer section for easier assembly with hexagonal spanner



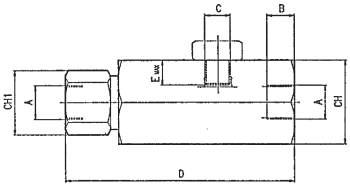
PERFORMANCE DATA						
ORDERING CODE	Symbol	Ports (ØA)	Q_{MAX} (l/min)	B	C	CH
FT 257/6-14		1/4“ BSP	16	12,5	63	22
FT 257/6-38		3/8” BSP	30	12,5	69	27
FT 257/6-12		1/2” BSP	60	12,5	80,5	32
FT 257/6-34		3/4” BSP	100	17	99,5	36
FT 257/6-1		1” BSP	160	20	117	46
FT 257/6-114		1-1/4” BSP	250	22	134,5	55

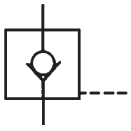
Subject to technical and dimensional changes without notice
Available on request port sizes 1-1/2” BSP - 2” BSP

FT 257/7 PILOT OPERATED CHECK VALVES



- Pilot operated check valves, poppet type
- BSP thread ports for in-line assembly
- Pilot port: 1/4” BSP
- Body, poppet and spring in steel
- Maximum operating pressure: 320 bar
- Outer section for easier assembly with hexagonal spanner

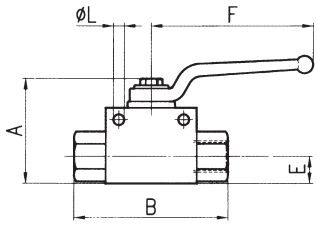


PERFORMANCE DATA									
ORDERING CODE	Symbol	Ports (ØA)	Q_{MAX} (l/min)	Pilot ratio	B	D	E	CH	CH1
FT 257/7-14		1/4“ BSP	16	1 / 5,3	12,5	100	12	38	28
FT 257/7-38		3/8” BSP	30	1 / 5	12,5	115	12	41	34
FT 257/7-12		1/2” BSP	60	1 / 5,3	15,5	139	12	46	41

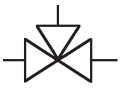
Subject to technical and dimensional changes without notice - Available on request port
Available on request port sizes 3/4” BSP - 1” BSP - 1-1/4” BSP

FT 221/* SHUT-OFF VALVES

- Shut-off valves, ball type
- BSP thread ports for in-line assembly
- Available 2-way or 3-way executions (see symbol)
- Body in steel
- Lever and ball in chromium-plated steel
- Maximum pressure: 500 bar
- PTFE ball seals



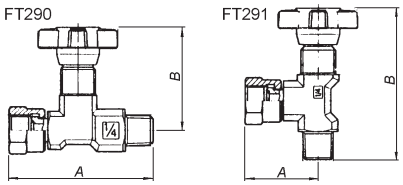
PERFORMANCE DATA

ORDERING CODE	Symbol	Ports	Q_{MAX} (l/min)	A	B	E	F	ØL
FT 221/1-14		1/4“ BSP	16	44,5	71	13	115	4,5
FT 221/1-38		3/8” BSP	30	50	72	16,5	115	5,5
FT 221/1-12		1/2” BSP	60	51	83	17	115	6,5
FT 221/1-34		3/4” BSP	100	71,5	97	24	160	6,5
FT 221/1-1		1” BSP	160	76	113	26,5	160	6,5
FT 221/1-114		1-1/4” BSP	250	106	110	35	200	n.a.
FT 221/3-14		1/4” BSP	16	44,5	71	13	115	M4
FT 221/3-38		3/8” BSP	30	50	72	16,5	115	M4
FT 221/3-12		1/2” BSP	60	51,5	85	17,5	115	M5

Subject to technical and dimensional changes without notice
Available on request port sizes 1-1/2” BSP - 2” BSP

FT 29* SHUT-OFF VALVES

- Shut-off valves, needle type
- BSP thread ports for in-line assembly
- Body, needle and spring in steel
- Maximum operating pressure: 400 bar



PERFORMANCE DATA

ORDERING CODE	Symbol	Ports	A	B
FT 290		1/4“ BSP	61,5	45
FT 291		1/4” BSP	30	66

Subject to technical and dimensional changes without notice

HYDRAULIC SCREW-IN CHECK VALVES type VUC
DIRECT ACTING

- Suitable for standard cavity **3/4" 16 UNF**
- 2-way direct acting check valves
- One direction flow, poppet valve
- Maximum operating pressure: 320 bar
- Maximum recommended flow rate: 32 l/min
- Steel body
- Poppet in hardened and grinded steel
- External parts burnished
- Mass 0,05 kg

SYMBOL

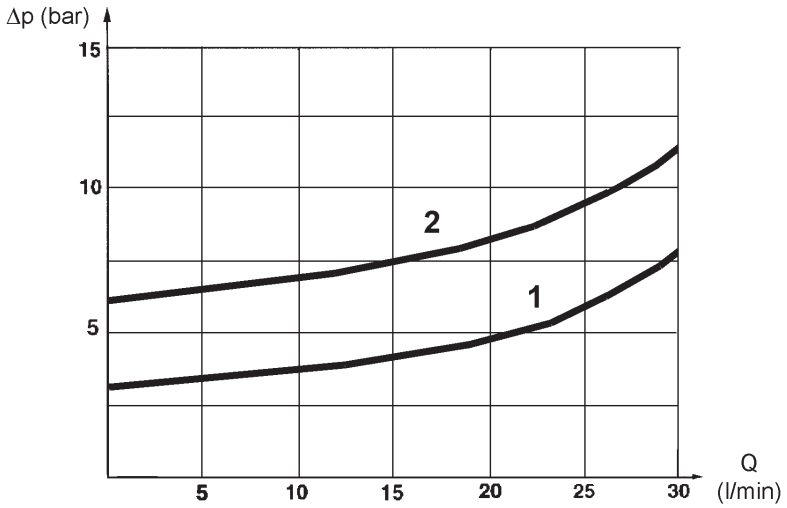
ORDERING CODE

VUC-34.00

VUC	Direct acting check valve
34	Size (3/4" 16 UNF)
00	Spring type: 00 – Cracking pressure (opening) 3 bar 01 – Cracking pressure (opening) 8 bar

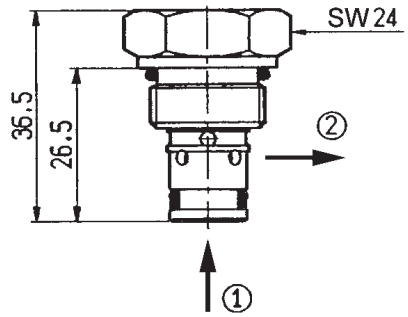
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **VUC-34,** with mineral oil at 36cSt and 50°C for flow 1→2

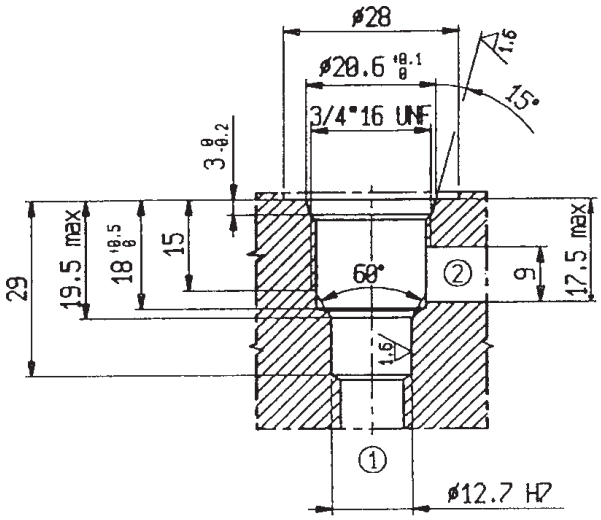


1) Spring type 00 **2)** Spring type 01

OVERALL DIMENSIONS

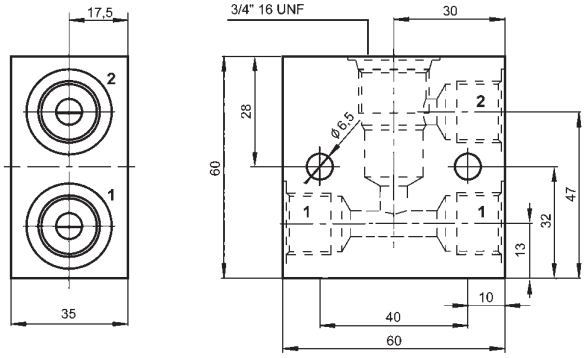


Tightening torque 45Nm



Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY



Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

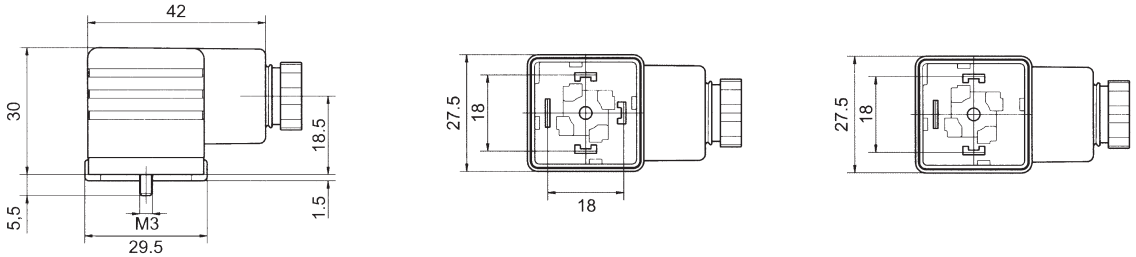
ISO 4400 PLUGS type KA

- Electric plugs for hydraulic solenoid operated valve
- Protection class: IP65
- Insulation group: C (VDE 0110 1/89)
- Maximum voltage: AC 250V – DC 300V
- Nominal current: 10A
- Maximum current: 16A (at 40°C)
- Contacts resistance: ≤4m Ω
- Gasket material: NBR
- Fixing screw: M3 x 32

TECHNICAL DATA				
ORDERING CODE	**Cable connection**	**Max wires section [mm2]**	**Colour**	**Poles**
KA-132000B1	PG 11 (8-10mm)	3 x 1,5mm2	Black	2+G
KA-132000A1	PG 11 (8-10mm)	3 x 1,5mm2	Grey	2+G

TECHNICAL DATA					
ORDERING CODE	**Circuit**	**Input voltage [V]**	**Colour**	**Cable conn.**	**Poles**
KA-132R13B1	Current Rectifier	230 AC	Black	PG 11	2+G
KA-132D54T1	Diode + yellow LED	12-24 DC	Transparent	PG 11	2+G
KA-132L34T1	Bipolar yellow LED	12-24 AC/DC	Transparent	PG 11	2+G
KA-132L35T1	Bipolar yellow LED	115 AC/DC	Transparent	PG 11	2+G
KA-132L36T1	Bipolar yellow LED	230 AC/DC	Transparent	PG 11	2+G
KA-132V54T1	Varistor + yellow LED	12-24 AC/DC	Transparent	PG 11	2+G

OVERALL DIMENSIONS

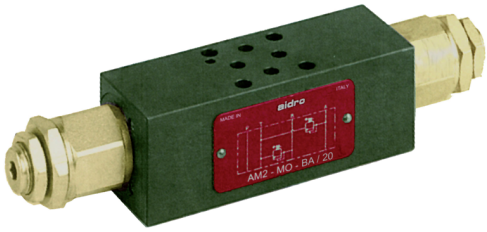


Subject to technical and dimensional changes without notice

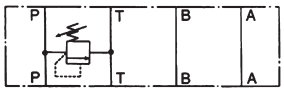
PRESSURE CONTROL VALVES

ISO 02 HYDRAULIC STACKABLE VALVES type AM2-MO
PRESSURE RELIEF – DIRECT ACTING

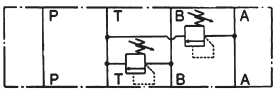
- Hydraulic pressure relief valves, direct acting
- **ISO 02** interface, stackable assembly
- Adjustment by screw with locking nut
- Max operating pressure: 320 bar
- Nominal flow: 20 l/min
- Mass: 0,85kg single valve (1,0 kg dual)
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt



SYMBOL



P



BA

Available on request
with single relief valve on B port

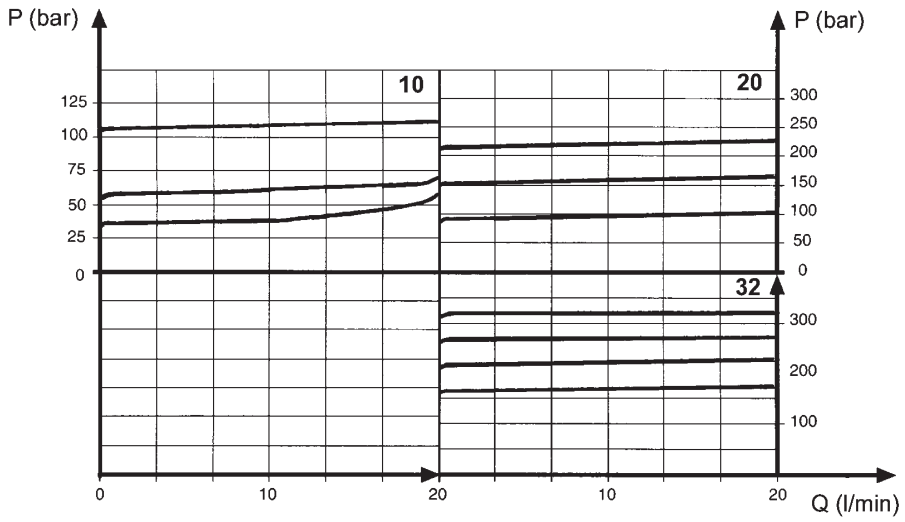
ORDERING CODE

AM2 – MO – BA / 20

AM2	ISO 02 stackable valve
MO	Direct acting pressure relief valve
BA	**P:** Relief on P **(see symbol)** – A, B free **BA:** Relief on A and B **(see symbol)** – P, T free
20	Setting range: **10** = 63 to 125 bar **20** = 80 to 210 bar **32** = 125 to 320 bar

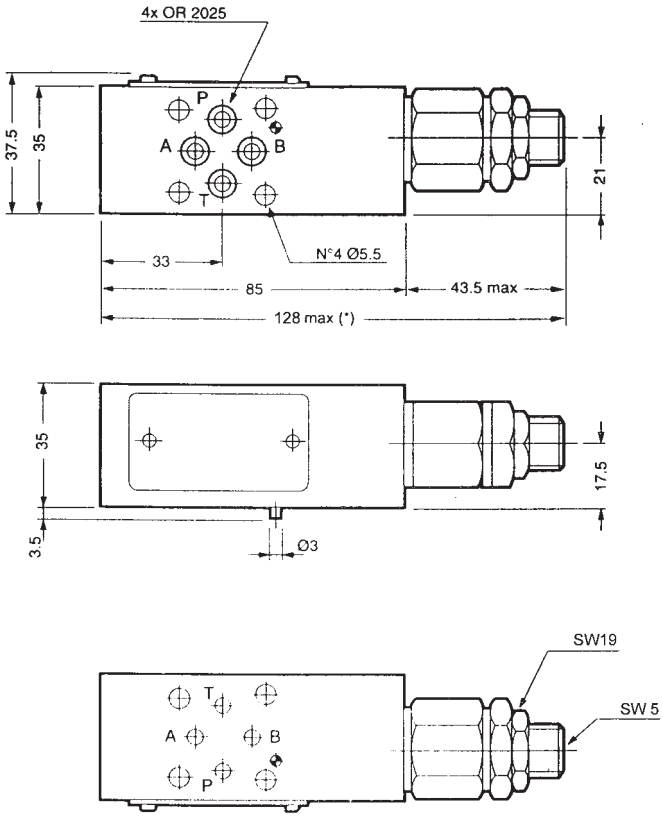
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **AM2-MO,** with mineral oil at 36cSt and 50°C with different setting ranges and set relief pressures



10) setting range 63 to 125 bar **20)** setting range 80 to 210 bar **32)** setting range 125 to 320 bar

OVERALL DIMENSIONS

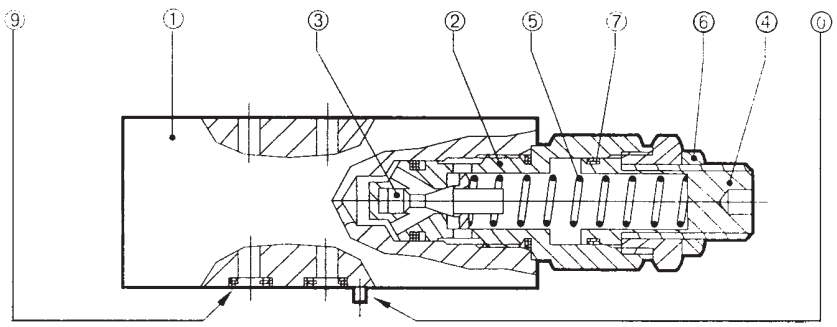


(*) for AM2-MO-BA/20: 180 max

Subject to technical and dimensional changes without notice

TYPICAL SECTION

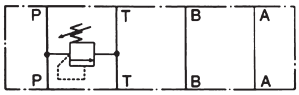
0	Pin	5	Spring
1	Body	6	Locking nut
2	Seat	7	Seal
3	Poppet	9	Seal
4	Setting screw		



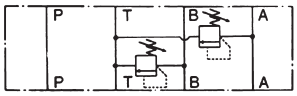
ISO 03 HYDRAULIC STACKABLE VALVES type AM3-MO
PRESSURE RELIEF – DIRECT ACTING

- Hydraulic pressure relief valves, direct acting
- **ISO 03** interface, stackable assembly
- Adjustment by screw with locking nut
- Max operating pressure: 320 bar
- Nominal flow: 32 l/min
- Mass: 1,7 kg single valve (2,3kg dual)
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt

SYMBOL



P



BA

Available on request
with single relief valve on B port

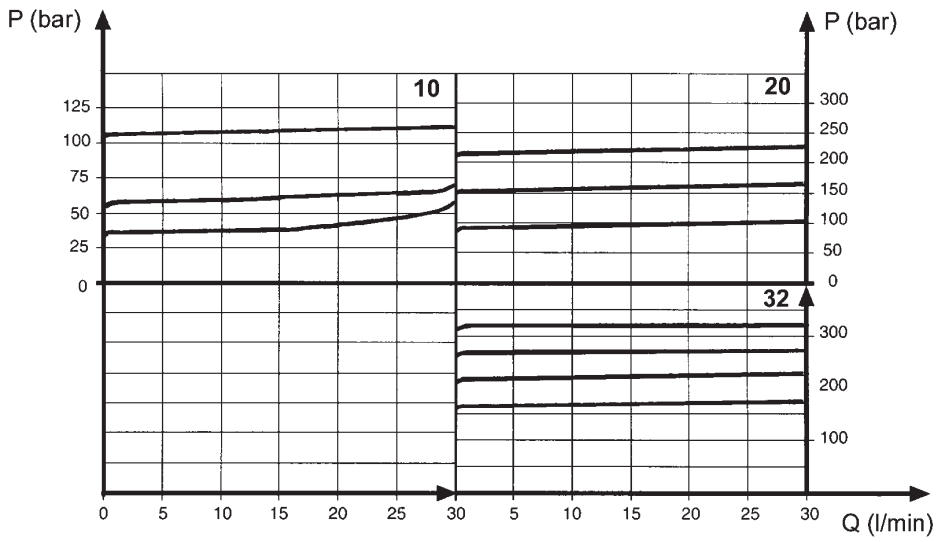
ORDERING CODE

AM3 – MO – P / 20

AM3	ISO 03 stackable valve
MO	Direct acting pressure relief valve
P	**P:** Relief on P **(see symbol)** – A, B and T free **BA:** Relief on A, B **(see symbol)** – P, T and T free
20	Setting range: **10** = 25 to 125 bar **20** = 40 to 250 bar **32** = 100 to 320 bar

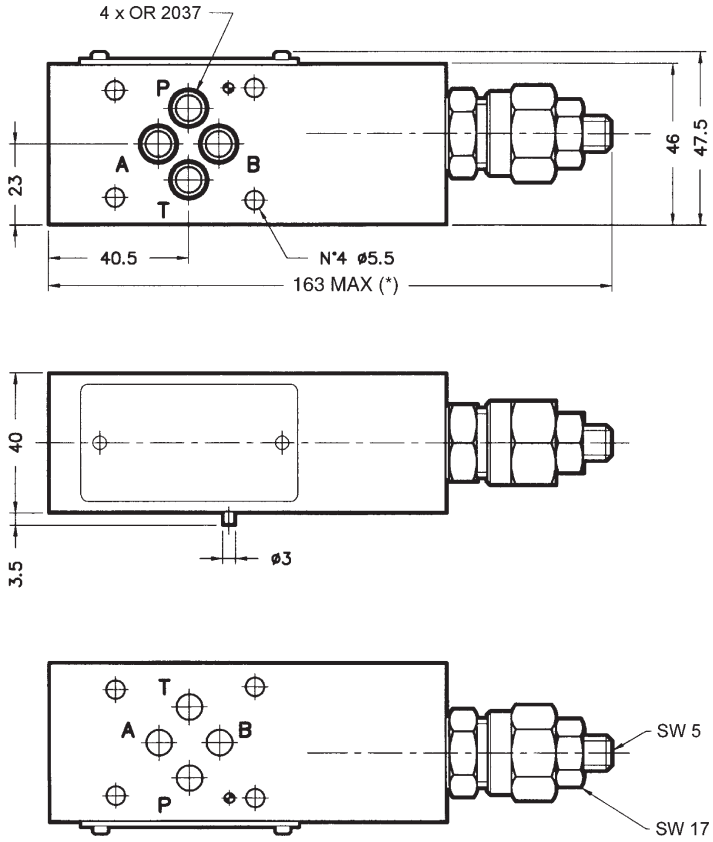
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **AM3-MO**, with mineral oil at 36cSt and 50°C with different setting ranges and set relief pressures



10) setting range 25 to 125 bar **20)** setting range 40 to 250 bar **32)** setting range 100 to 320 bar

OVERALL DIMENSIONS

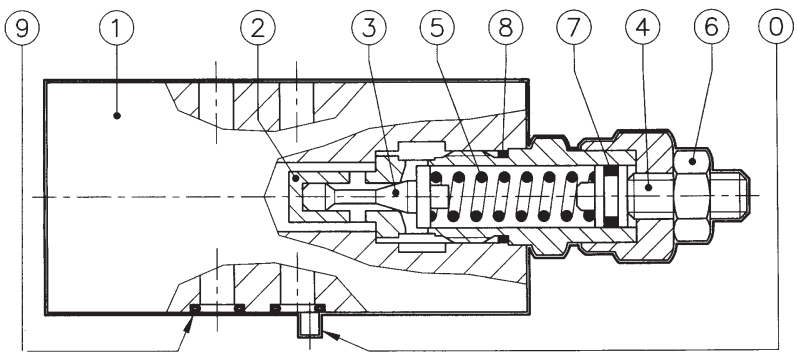


(*) for AM3-MO-BA/20: 216 max

Subject to technical and dimensional changes without notice

TYPICAL SECTION

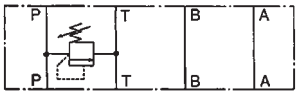
0	Pin	5	Spring
1	Body	6	Locking nut
2	Seat	7	Seal
3	Differential area poppet	8	Seal
4	Setting screw	9	Seal



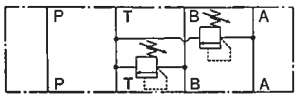
ISO 05 HYDRAULIC STACKABLE VALVES type AM5-MP
PRESSURE RELIEF – PILOT OPERATED

- Hydraulic pressure relief valves, pilot operated
- **ISO 05** interface, stackable assembly
- Adjustment by screw with locking nut
- Max operating pressure : 320 bar
- Nominal flow: 100 l/min
- Mass: 2,7kg single valve (3,6kg dual)
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



P



BA

Available on request
with single relief valve on B or A port

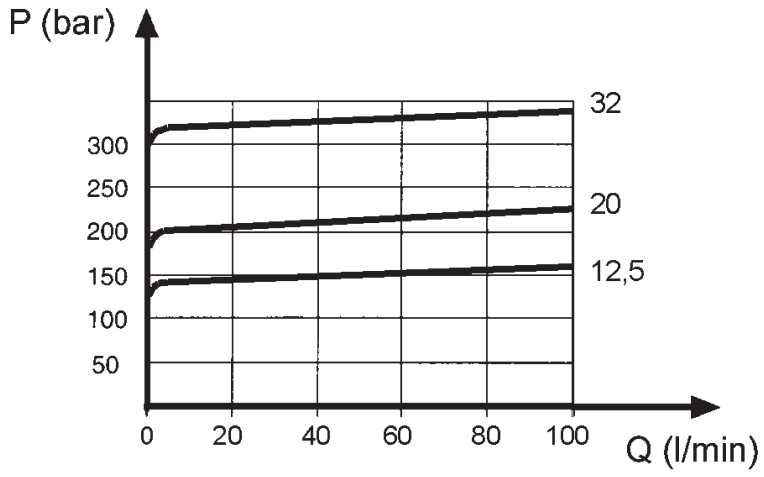
ORDERING CODE

AM5 – MP – P / 20

AM5	ISO 05 stackable valve
MP	Pilot operated pressure relief valve
P	P: Relief on P **(see symbol)** – A, B and T free BA: Relief on A, B **(see symbol)** – P, T free
20	Setting range: 12,5 = 10 to 140 bar 20 = 20 to 210 bar 32 = 20 to 320 bar

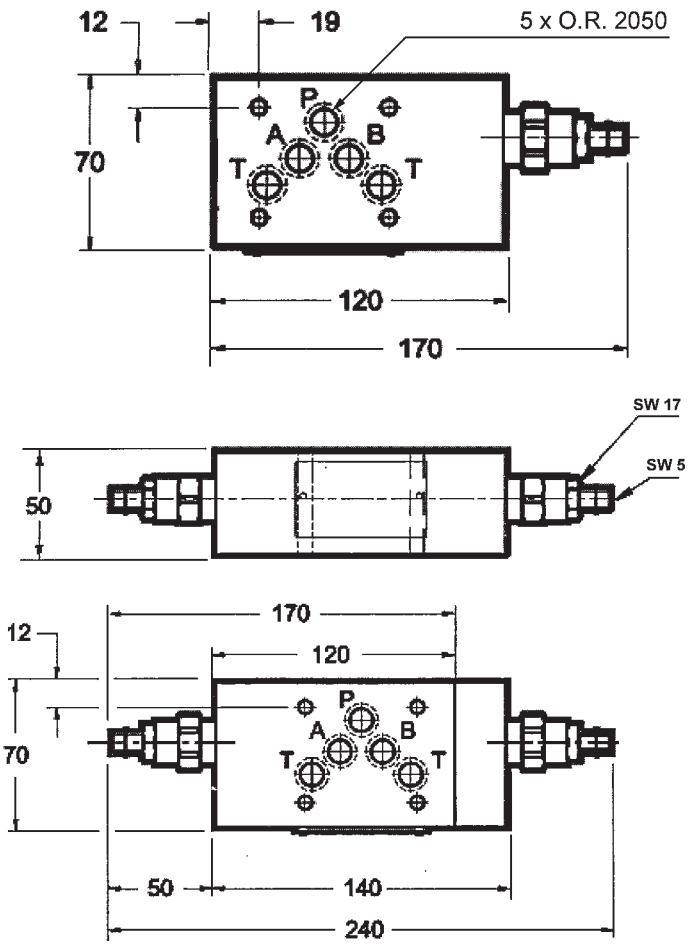
TYPICAL DIAGRAM

Typical P-Q curves for valves AM5-MP, with mineral oil at 36cSt and 50°C with different settings at maximum set relief pressures



12,5) setting 140 bar **20)** setting 210 bar **32)** setting 320 bar

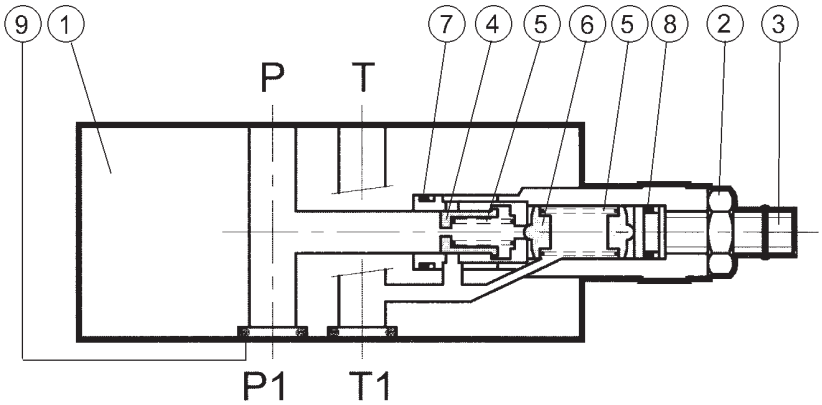
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

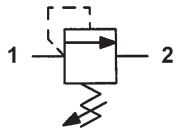
1	Body	6	Pilot poppet
2	Locking nut	7	Seal
3	Setting screw	8	Seal
4	Main poppet	9	Seal
5	Spring		



HYDRAULIC SCREW-IN PRESSURE RELIEF VALVES type MO-010 DIRECT ACTING

- Suitable for standard cavity **3/4" 16 UNF**
- 2-way direct acting relief valves, poppet type
- Wide setting range: 25 to 250 bar
- Maximum operating pressure: 250 bar
- Maximum recommended flow: 16 l/min
- External parts zinc plated
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,14 kg

SYMBOL



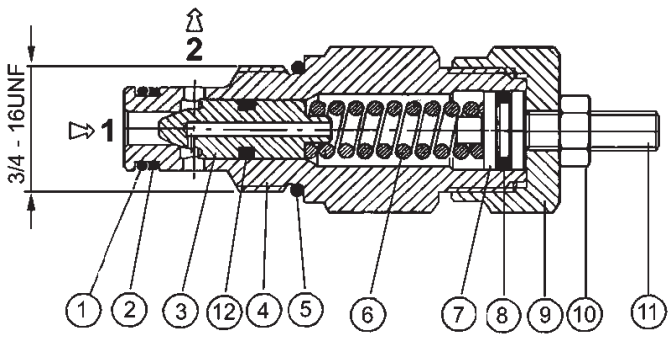
ORDERING CODE

MO – 010/20

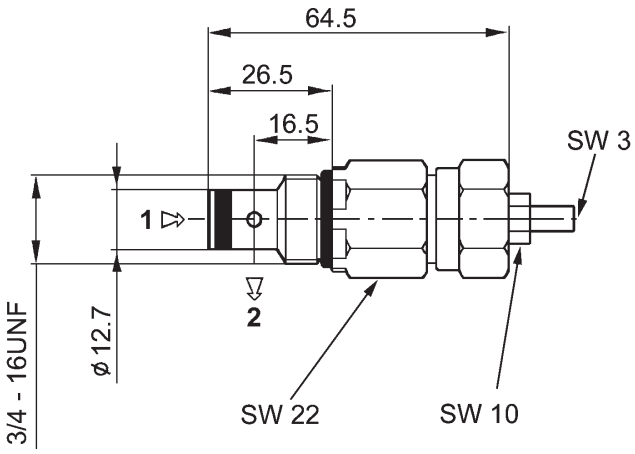
MO	Direct acting relief valve
010	Nominal size (3/4" 16 UNF)
20	Spring type (setting range 25 to 250 bar)

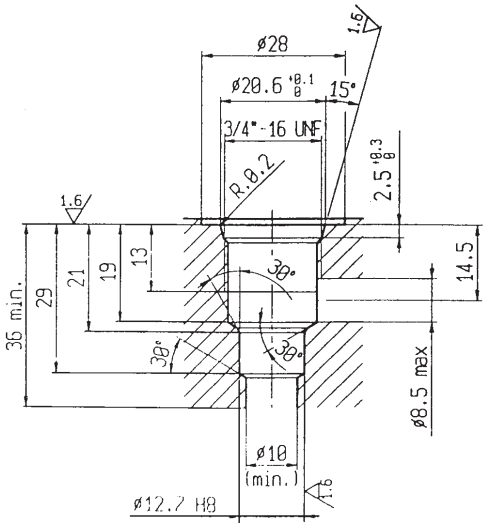
TYPICAL SECTION

1	Seal	7	Spring plate
2	Seal	8	Seal
3	Poppet	9	Adjustment holder
4	Body	10	Locking nut
5	Seal	11	Adjustment screw
6	Spring	12	Seal



OVERALL DIMENSIONS

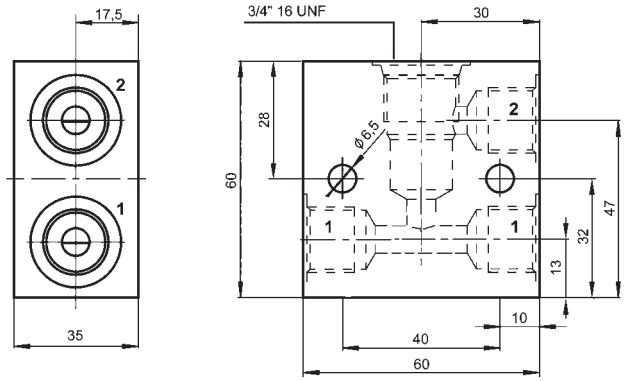




SPARE PARTS		
Position	**Description**	
1	O-Ring	Ø 16,36 x 2,20 70 Sh
2	Teflon Ring	Ø 9,7 x 12,7 x 1,4
3	O-Ring	Ø 9,25 x 1,78 70 Sh

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

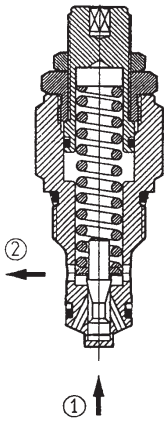


Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

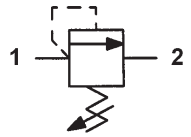
Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN PRESSURE RELIEF VALVES type MO-020 DIRECT ACTING

- Suitable for standard cavity **3/4" 16 UNF**
- 2-way direct acting relief valves, poppet type
- Fast response and low hysteresis in shutting
- Maximum operating pressure: 350 bar
- Maximum flow rate: 25 l/min
- External parts zinc plated
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,13 kg



SYMBOL



ORDERING CODE

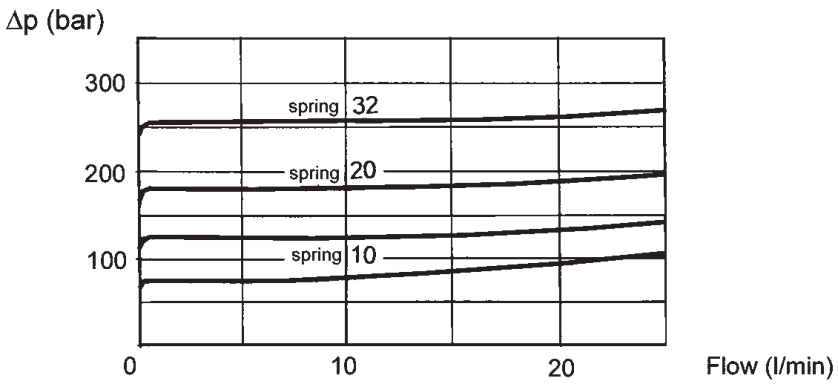
MO – 020/32

MO	Direct acting relief valve
020	Nominal size (3/4" 16 UNF)
32	Spring type **(see table)**

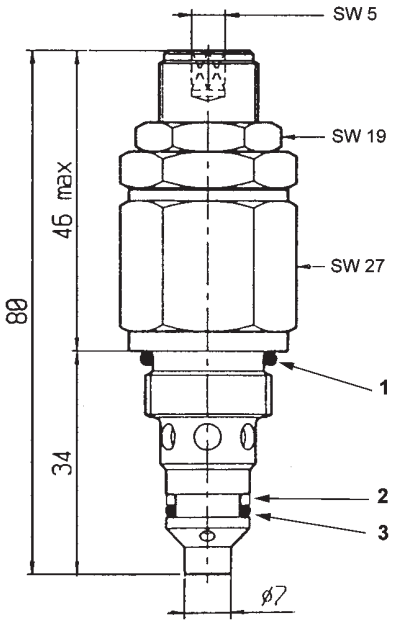
SPRING	SETTING [bar]	INCREASE [bar/turn]
10	32 to 125	15
20	63 to 200	30
32	125 to 350	40

TYPICAL DIAGRAM

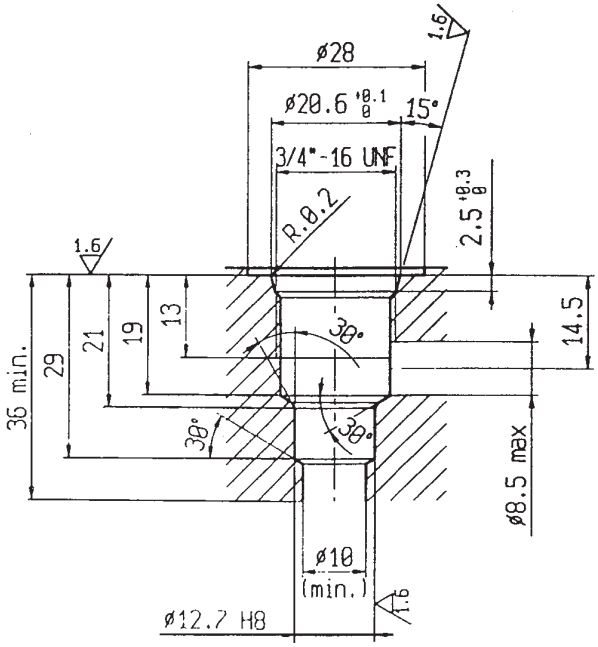
After final test the valves are respectively set to 100, 180 and 350 bar (±10%) with 5 l/min flow rate.



OVERALL DIMENSIONS



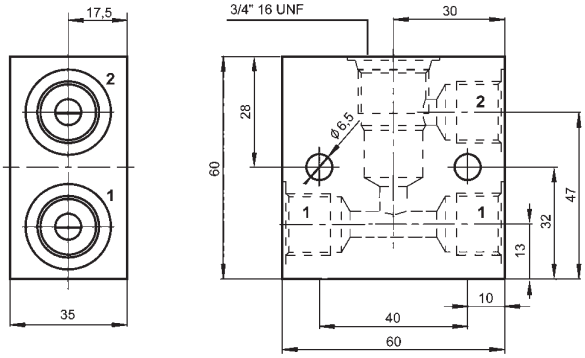
Tightening torque 45-50Nm



SPARE PARTS		
Position	Description	
1	O-Ring	Ø 16,36 x 2,20 70 Sh
2	Teflon Ring	Ø 9,7 x 12,7 x 1,4
3	O-Ring	Ø 9,25 x 1,78 70 Sh

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

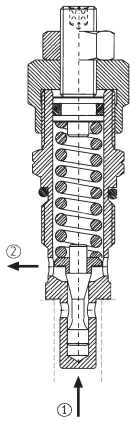


Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

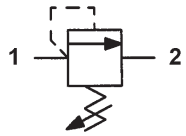
Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN PRESSURE RELIEF VALVES type MO-3 DIRECT ACTING

- Suitable for cavity **M20** (VS 30)
- 2-way direct acting relief valves, poppet type
- Fast response and low hysteresis in shutting
- Maximum operating pressure: 320 bar
- Maximum flow rate: 40 l/min
- External parts burnished
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,17 kg



SYMBOL



ORDERING CODE

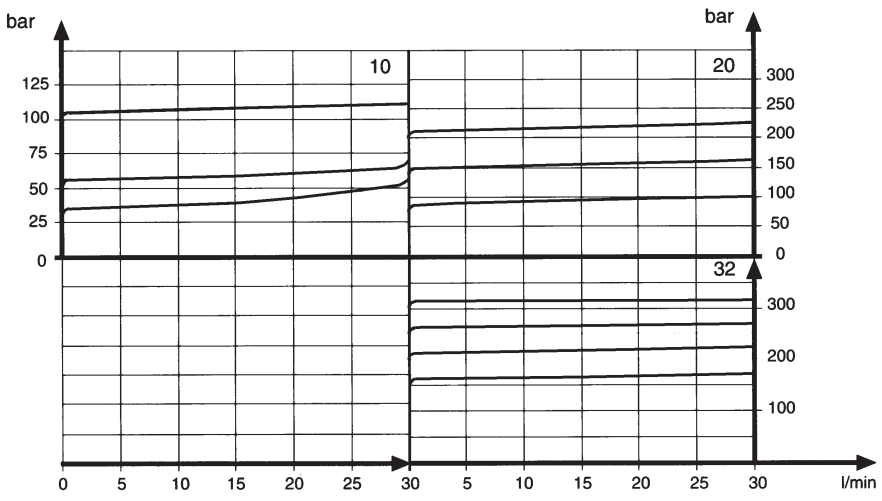
MO – 3/20

MO	Direct acting relief valve
3	Nominal size (M20 – VS 30)
20	Spring type **(see table)**

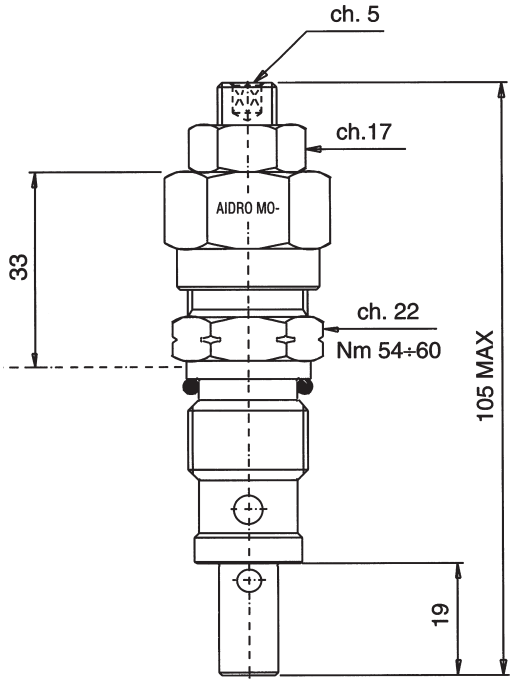
SPRING	SETTING [bar]	INCREASE [bar/turn]
10	25 to 125	25 to 125
20	40 to 250	40 to 250
32	100 to 320	100 to 320

TYPICAL DIAGRAM

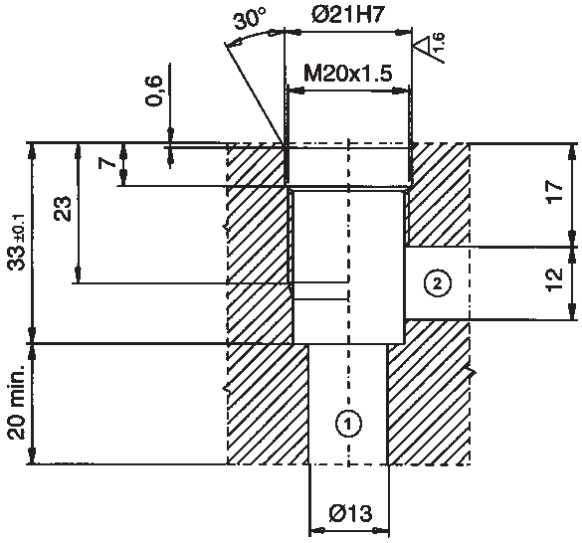
After final test the valves are respectively set to 100, 200 bar (±10%) and 320 bar (±5%) with 6 l/min flow rate.



OVERALL DIMENSIONS



Tighening torque 60Nm



SPARE PARTS		
Position	**Code**	**Description**
1	OR 121	O-Ring Ø 15,88 x 2,62 70 Sh

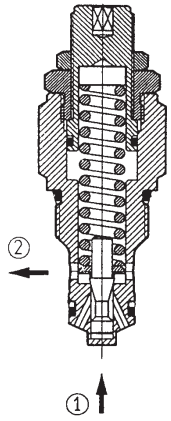
Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

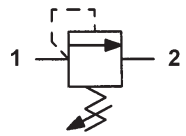
Non-Standard. Available on request.

HYDRAULIC SCREW-IN PRESSURE RELIEF VALVES type MO-4 DIRECT ACTING

- Suitable for standard cavity **7/8" 14 UNF**
- 2-way direct acting relief valves, poppet type
- Fast response and low hysteresis in shutting
- Maximum operating pressure: 350 bar
- Maximum flow rate: 50 l/min
- External parts zinc plated
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,13 kg



SYMBOL



ORDERING CODE

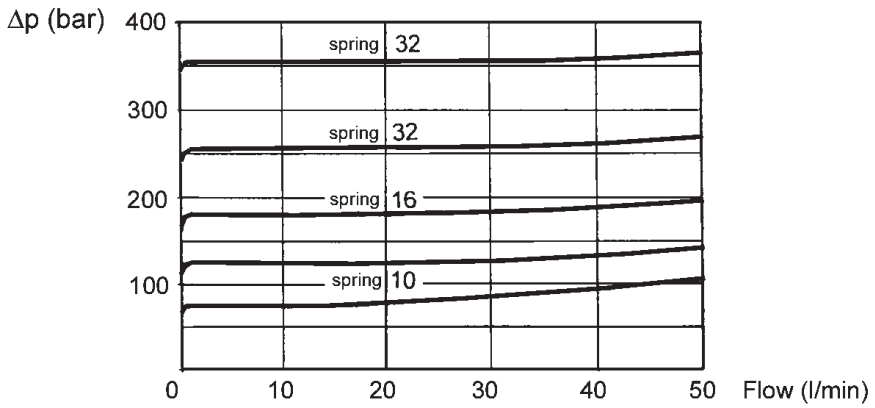
MO – 4/16

MO	Direct acting relief valve
4	Nominal size (7/8" 14 UNF)
16	Spring type **(see table)**

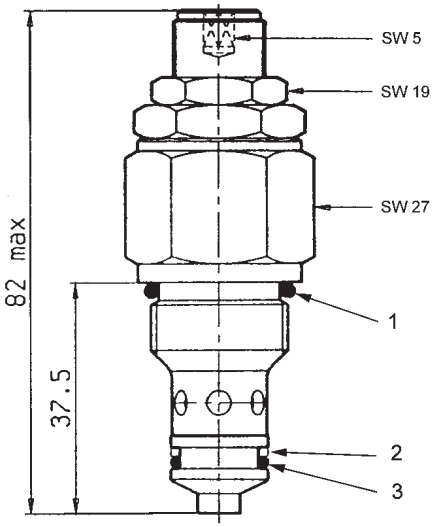
SPRING	SETTING [bar]	INCREASE [bar/turn]
10	20 to 130	16,5
16	40 to 180	16,5
32	60 to 350	51

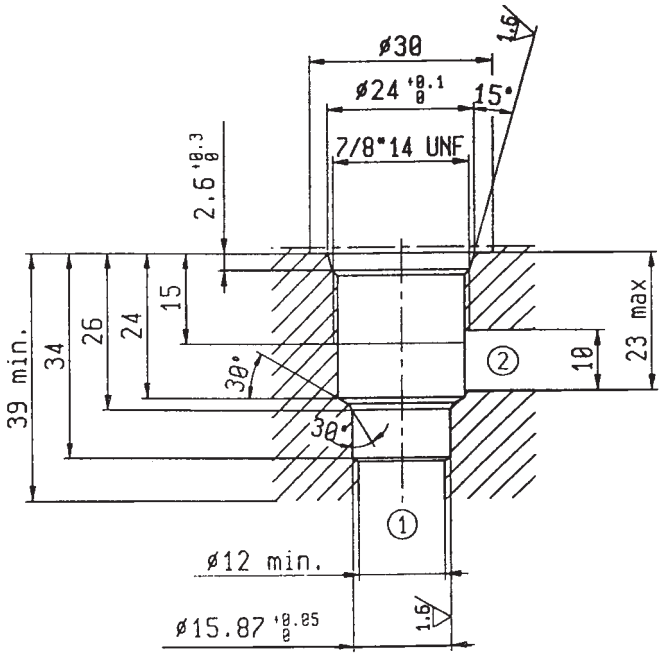
TYPICAL DIAGRAM

After final test the valves are respectively set to 100, 180 and 350 bar (±10%) with 5 l/min flow rate.



OVERALL DIMENSIONS

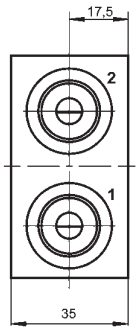


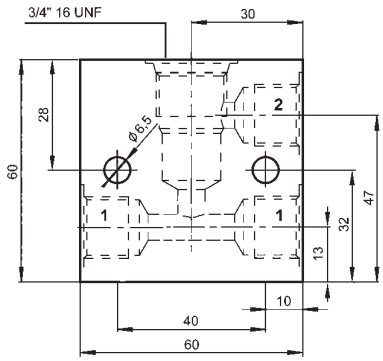


SPARE PARTS	
Position	**Description**
1	O-Ring Ø 19,18 x 2,46 70 Sh
2	Teflon Ring Ø 12,8 x 15,86 x 1,4
3	O-Ring Ø 12,42 x 1,78 70 Sh

Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY





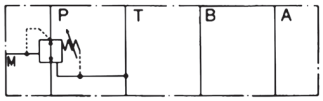
Code	Ports
LAB-78-2/38	3/8" BSP
LAB-78-2/12	1/2" BSP
Mass: 0,37 kg	

Suitable for standard 2-way screw-in valves, cavity 7/8" 14 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

ISO 02 HYDRAULIC STACKABLE VALVES type AM2-RO
PRESSURE REDUCING – DIRECT ACTING

- Hydraulic pressure reducing valves, direct acting
- **ISO 02** interface, stackable assembly
- Adjustment by screw with locking nut
- Max nominal pressure: 320 bar
- Max reduced pressure: 250 bar
- Max recomm. flow: 20 l/min (controlled channels)
  30 l/min (free channels)
- Mass: 0,60kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



P

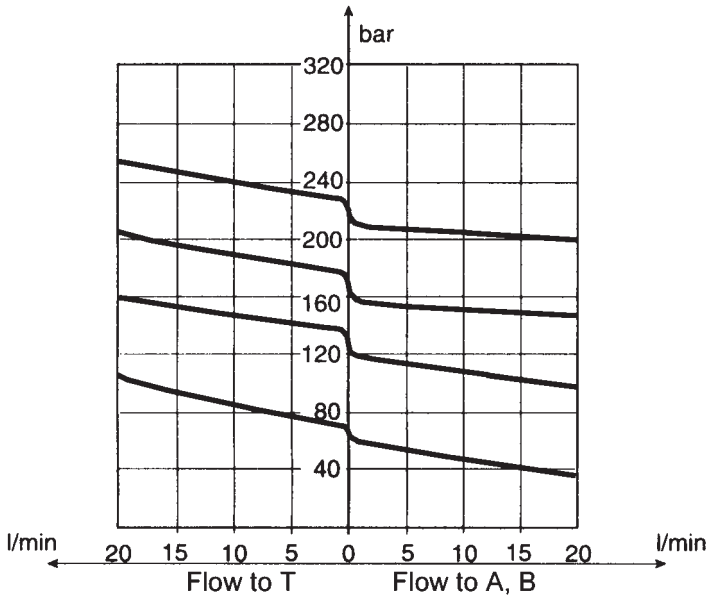
ORDERING CODE

AM2 – RO – P / 16

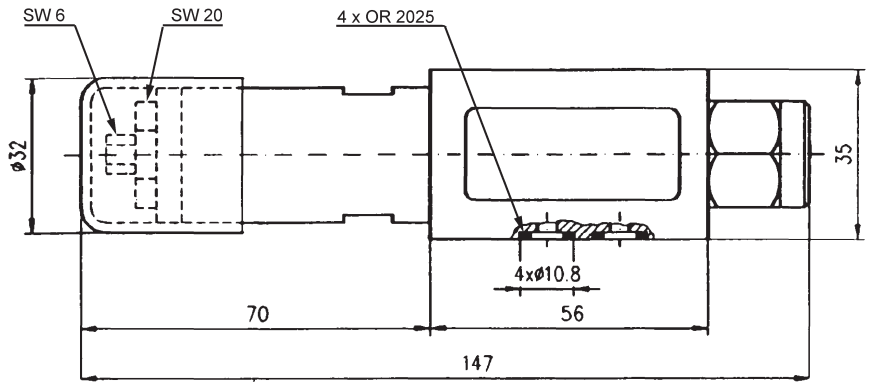
AM2	ISO 02 stackable valve
RO	Direct acting pressure reducing valve
P	Control on P with 3rd way on T line
16	Setting range: **6,3** = 5 to 80 bar **16** = 10 to 200 bar **20** = 25 to 250 bar

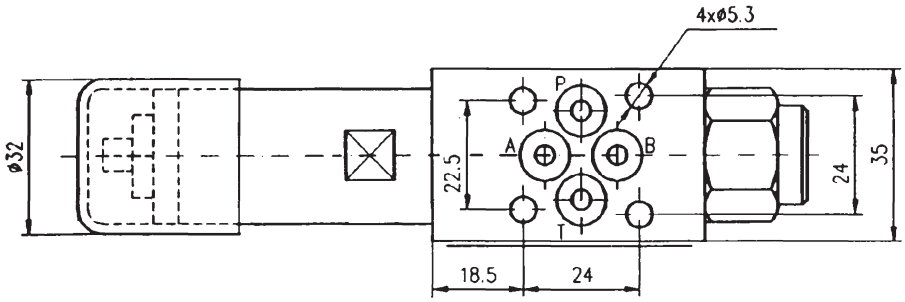
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **AM2-MO,** with mineral oil at 36cSt and 50°C with different setting ranges and set relief pressures



OVERALL DIMENSIONS

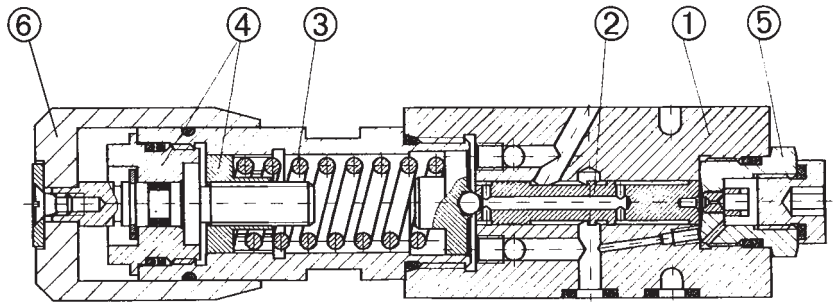




Subject to technical and dimensional changes without notice

TYPICAL SECTION

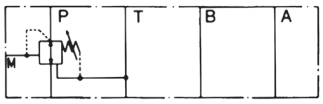
1	Body	4	Seat and setting screw
2	Throttling spool	5	Plug with 1/4" pressure gauge port
3	Spring	6	Handwheel (On request – add "V" in code)



ISO 03 HYDRAULIC STACKABLE VALVES type AM3-RO
PRESSURE REDUCING – DIRECT ACTING

- Hydraulic pressure reducing valves, direct acting
- **ISO 03** interface, stackable assembly
- Adjustment by screw with locking nut
- Max nominal pressure: 320 bar
- Max reduced pressure: 280 bar
- Max recomm. flow: 40 l/min (controlled channels)
  60 l/min (free channels)
- Mass: 1,45kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



P

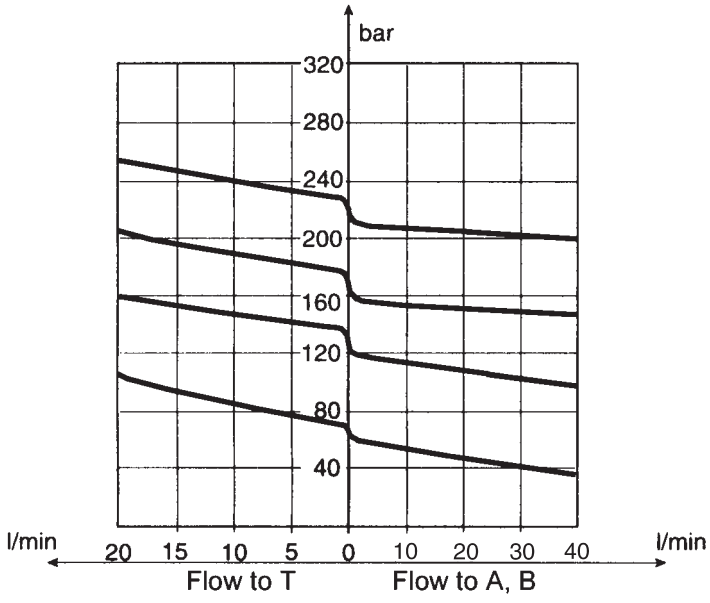
ORDERING CODE

AM3 – RO – * – P / 16

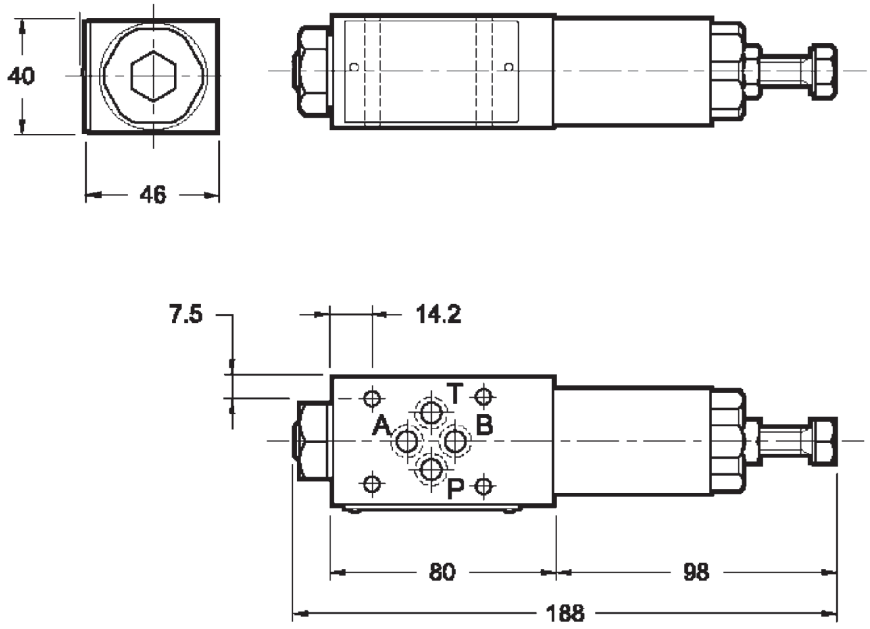
AM3	ISO 03 stackable valve
RO	Direct acting pressure reducing valve
*	Blank - standard flow C - limited flow (20l/min)
P	Control on P with 3rd way on T line
16	Setting range: **6,3** = 5 to 80 bar **16** = 10 to 200 bar **20** = 25 to 250 bar

TYPICAL DIAGRAM

Typical **P-Q** regulating curves for valves **AM3-RO,** with mineral oil at 36cSt and 50°C



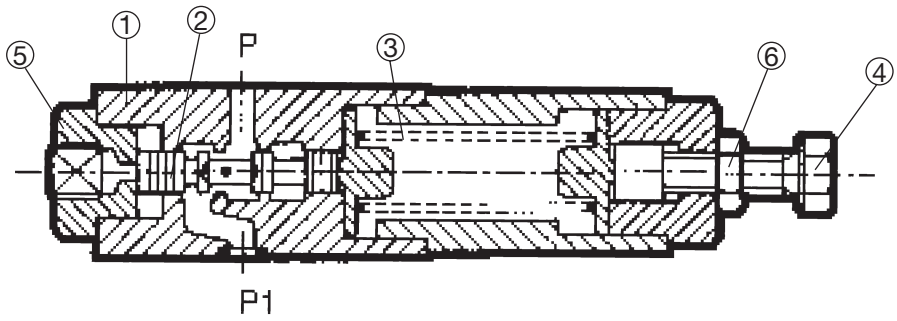
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

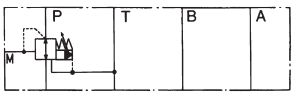
1	Body	4	Setting screw (CH 17 mm)
2	Throttling spool	5	Plug with 1/4" pressure gauge port
3	Spring	6	Locking nut



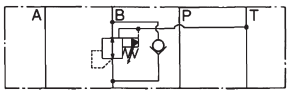
ISO 03 HYDRAULIC STACKABLE VALVES type AM3-RP
PRESSURE REDUCING – PILOT OPERATED

- Hydraulic pressure reducing valves, pilot operated
- **ISO 03** interface, stackable assembly
- Adjustment by screw with locking nut
- Max nominal pressure: 320 bar
- Max reduced pressure: 210 bar
- Max recomm. flow: 40 l/min (controlled channels)
  60 l/min (free channels)
- Mass: 1,10 kg (1,45 kg with check valve)
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



P



BC

Available on request
with control on A port and reverse free flow

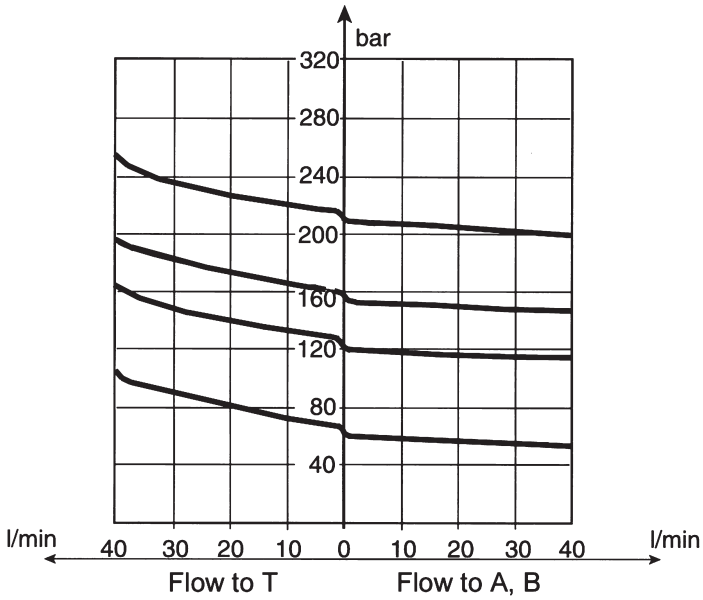
ORDERING CODE

AM3 – RP – BC / 20

AM3	ISO 03 stackable valve
RP	Pilot operated pressure reducing valve
BC	BC – Control on B port with reverse check valve P – Control on P with 3rd way on T line
20	Setting range: 6,3 = 5 to 70 bar 20 = 10 to 210 bar

TYPICAL DIAGRAM

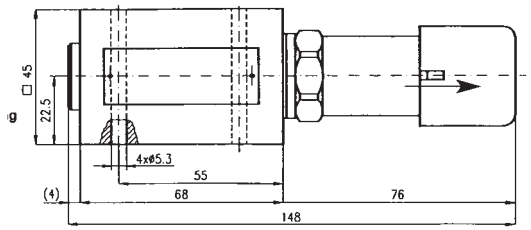
Typical **Δp-Q** curves for valves **AM3-RP**, with mineral oil at 36cSt and 50°C with different setting ranges and set relief pressures



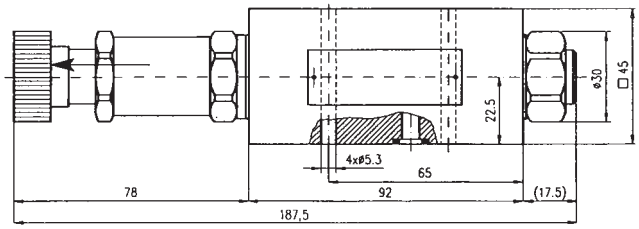
10) setting range 25 to 125 bar **20)** setting range 40 to 250 bar **32)** setting range 100 to 320 bar

OVERALL DIMENSIONS

AM3-RP-P



AM3-RP-BC-V

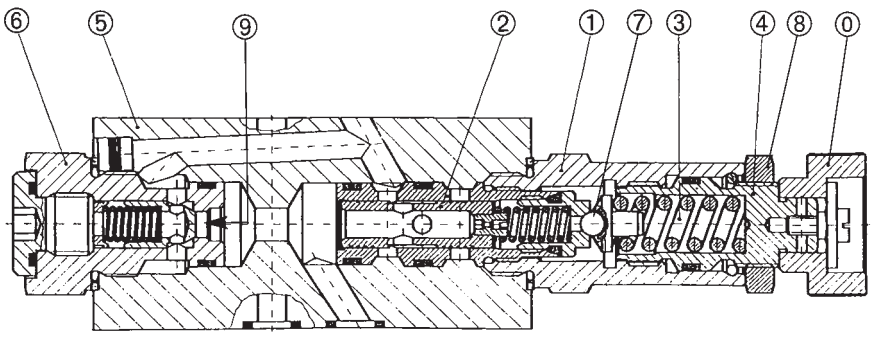


(*) for AM3-MO-BA/20: 216 max

Subject to technical and dimensional changes without notice

TYPICAL SECTION

0	Handwheel (On request – Add "V" in code)	5	Body
1	Pilot body	6	Plug with 1/4" pressure gauge port
2	Throttling spool	7	Pilot valve
3	Spring	8	Locking nut
4	Setting screw	9	Check valve (when required)

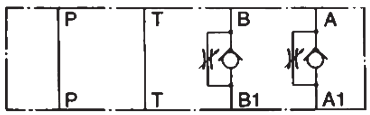


FLOW CONTROL VALVES

ISO 02 HYDRAULIC STACKABLE VALVES type AM2-FC
FLOW CONTROL – ADJUSTABLE

- Hydraulic flow control valves
- **ISO 02** interface, stackable assembly
- Meter-out control, reverse free flow
- Adjustment by screw with locking nut
- Max operating pressure : 320 bar
- Max recommended flow: 24 l/min
- Mass: 0,8 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



Available on request
with single flow control on A or on B

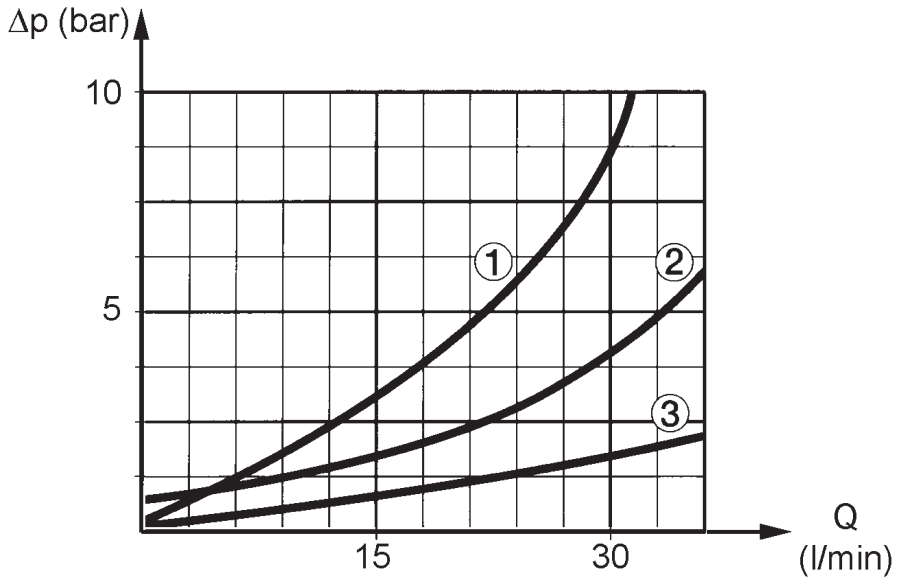
ORDERING CODE

AM2 – FC – AB

AM2	ISO 02 stackable valve
FC	Flow control, meter-out (referred to actuator)
AB	Dual control on A and B **(see symbol)** – P and T free

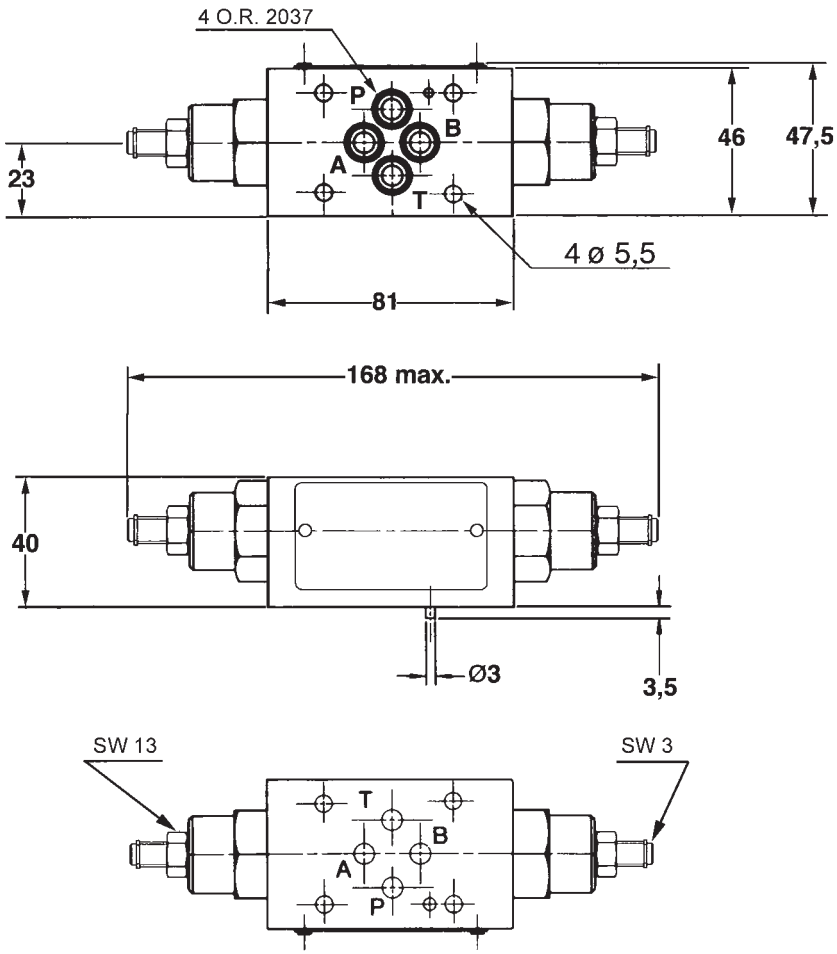
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **AM2-FC,** with mineral oil at 36cSt and 50°C and screw set at beginning of adjustment.
Diagrams for flow controlled A1→A, B1→B, flow through check A→A1, B→B1, and free channels



1) A1→A and B1→B **2)** A→A1 and B→B1 **3)** Free channels

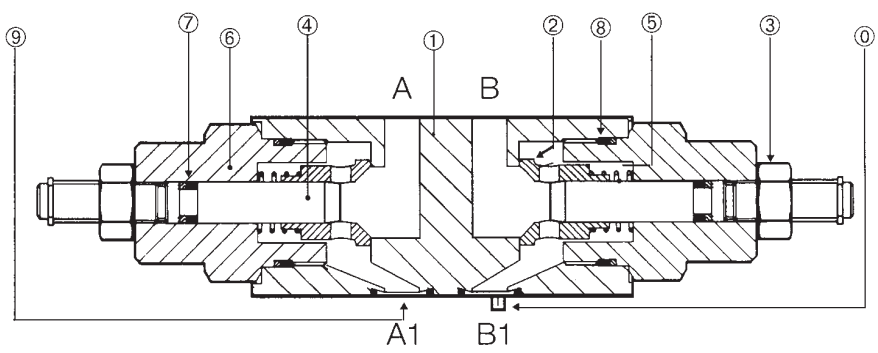
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

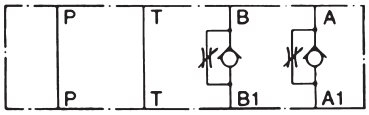
0	Pin	5	Spring
1	Body	6	Shaft's holder
2	Poppet sliding	7	Seal
3	Locking nut	8	Seal
4	Throttling shaft	9	Seal



ISO 03 HYDRAULIC STACKABLE VALVES type AM3-FC
FLOW CONTROL – ADJUSTABLE

- Hydraulic flow control valves
- **ISO 03** interface, stackable assembly
- Meter-out control, reverse free flow
- Adjustment by screw with locking nut
- Max operating pressure: 320 bar
- Max recommended flow: 50 l/min
- Mass: 1,2 kg
- Suitable for mineral oil according to ISO 18/14/16 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



Available on request
with single flow control on A or on B

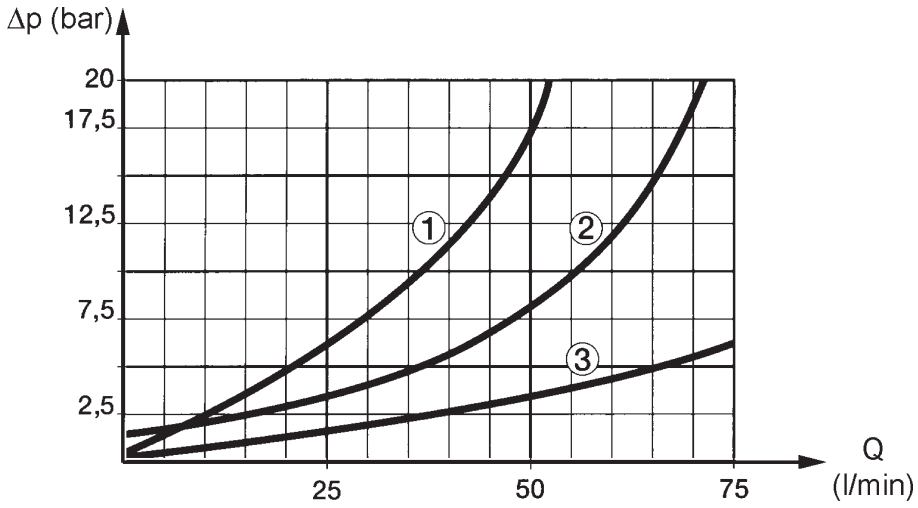
ORDERING CODE

AM3 – FC – AB

AM3	ISO 03 stackable valve
FC	Flow control, meter-out (referred to actuator)
AB	Dual control on A and B **(see symbol)** – P and T free

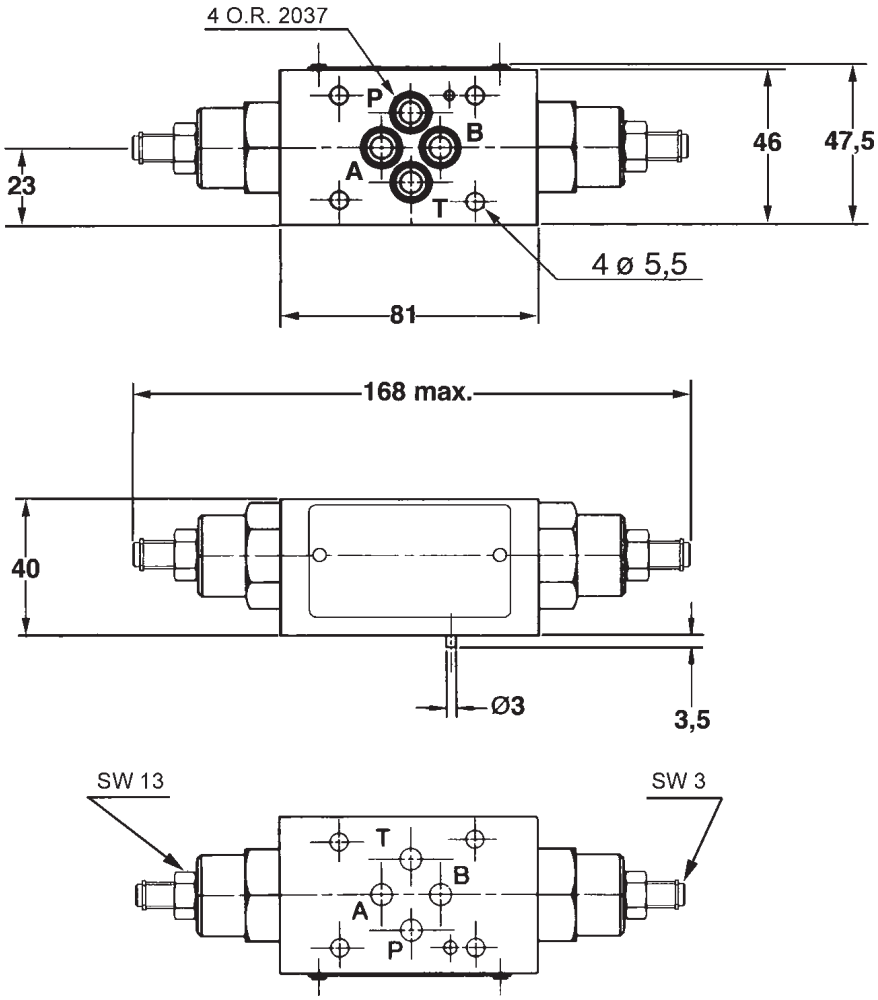
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **AM3-FC**, with mineral oil at 36cSt and 50°C and screw set at beginning of adjustment.
Diagrams for flow controlled A1→A, B1→B, flow through check A→A1, B→B1, and free channels



1) A1→A and B1→B **2)** A→A1 and B→B1 **3)** Free channels

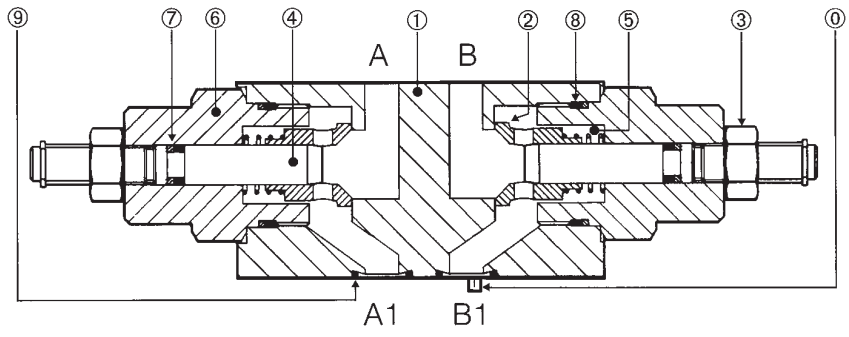
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

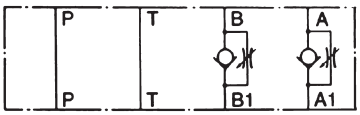
1	Body	6	Check device holder
2	Pin	7	Seal
3	Seat	8	Seal
4	Poppet	9	Seal
5	Spring	10	Pilot piston



ISO 03 HYDRAULIC STACKABLE VALVES type AM3-FX
FLOW CONTROL – ADJUSTABLE

- Hydraulic flow control valves
- **ISO 03** interface, stackable assembly
- Meter-in control, reverse free flow
- Adjustment by screw with locking nut
- Max operating pressure: 320 bar
- Max recommended flow: 50 l/min
- Mass: 1,2 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt

SYMBOL



Available on request
with single flow control on A or on B

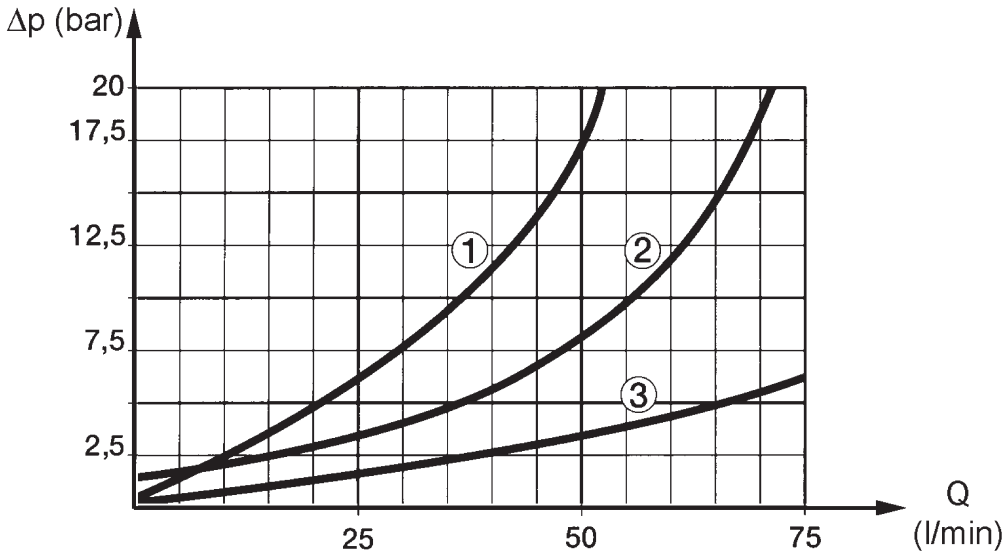
ORDERING CODE

AM3 – FX – AB

AM3	ISO 03 stackable valve
FX	Flow control, meter-in (referred to actuator)
AB	Dual control on A and B **(see symbol)** – P and T free

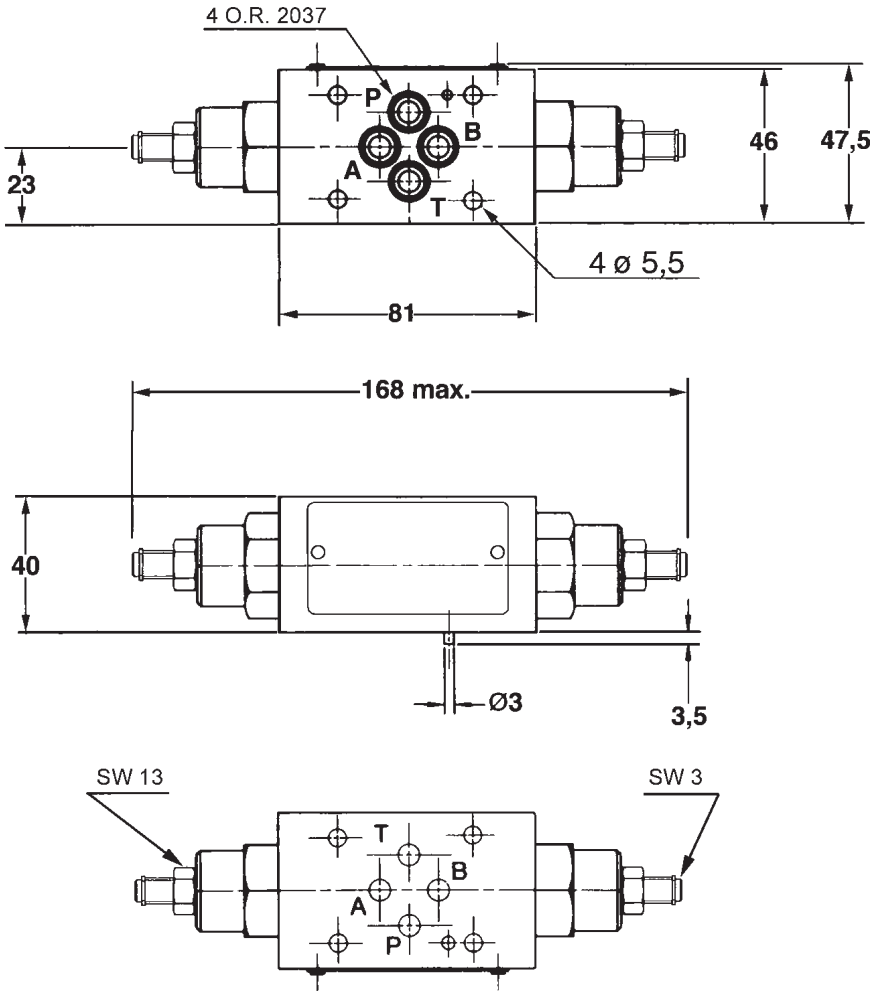
TYPICAL DIAGRAM

Typical **Δp-Q** curves for valves **AM3-FX**, with mineral oil at 36cSt and 50°C and screw set at beginning of adjustment. Diagrams for flow controlled A→A1, B→B1, flow through check A1→A, B1→B, and free channels



1) A→A1 and B→B1 **2)** A1→A and B1→B **3)** Free channels

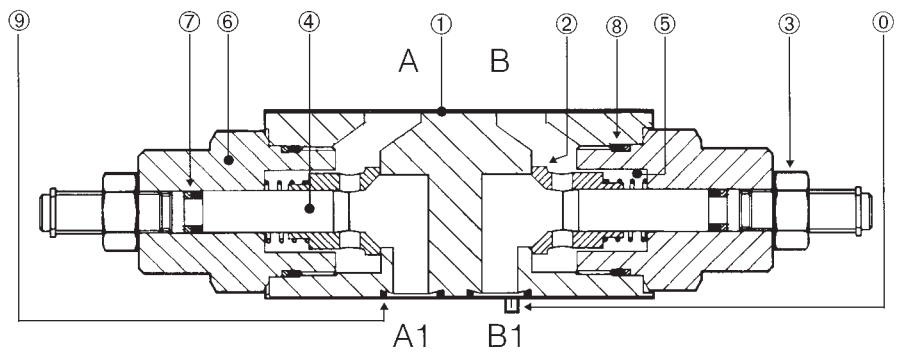
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

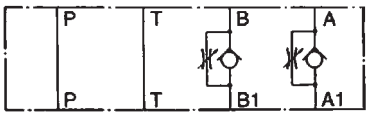
0	Pin	5	Spring
1	Body	6	Head
2	Poppet	7	Seal
3	Locking nut	8	Seal
4	Throttling needle	9	Seal



ISO 05 HYDRAULIC STACKABLE VALVES type AM5-FC
FLOW CONTROL – ADJUSTABLE

- Hydraulic flow control valves
- **ISO 05** interface, stackable assembly
- Meter-out control, reverse free flow
- Adjustment by screw with locking nut
- Max operating pressure : 320 bar
- Max recommended flow: 100 l/min
- Mass: 3,0 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



Available on request
with single flow control on A or on B

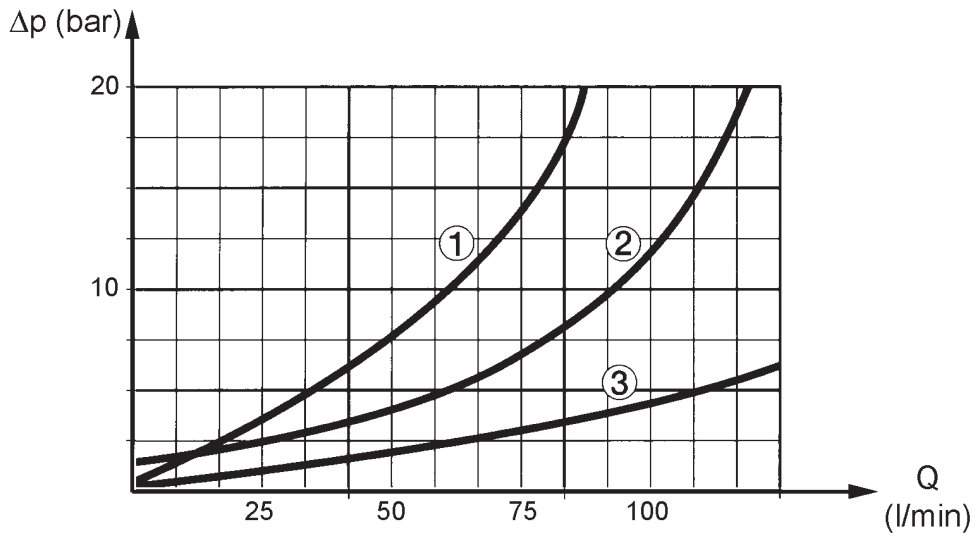
ORDERING CODE

AM5 – FC – AB

AM5	ISO 05 stackable valve
FC	Flow control, meter-out (referred to actuator)
AB	Dual control on A and B **(see symbol)** – P and T free

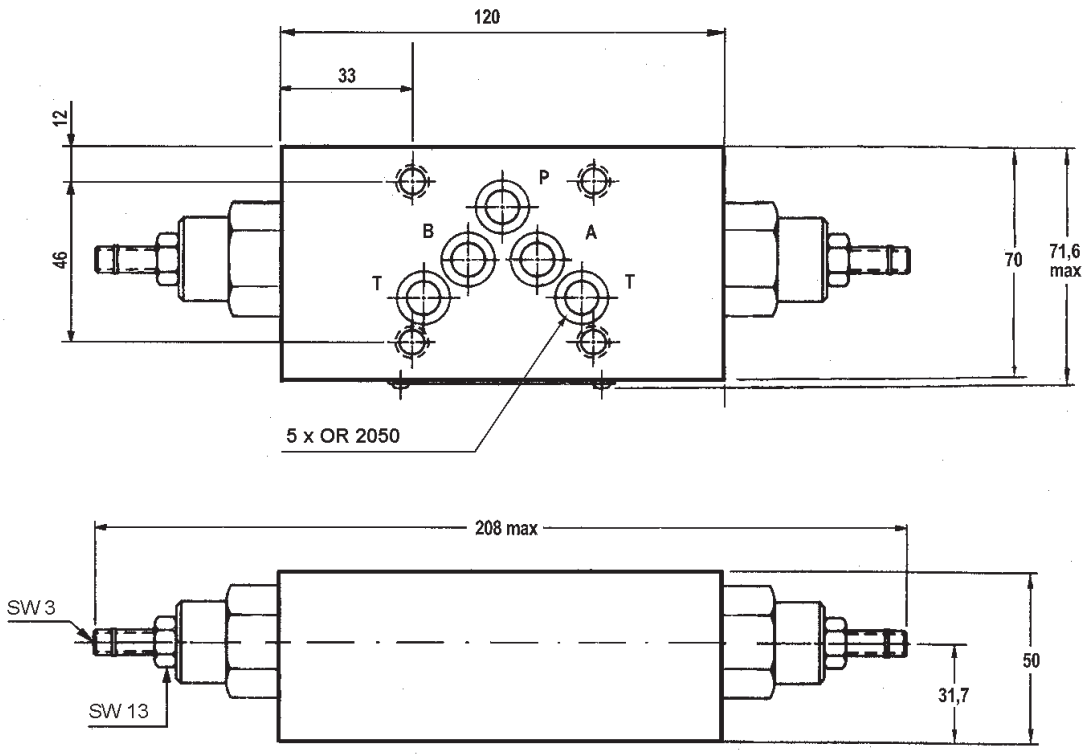
TYPICAL DIAGRAM

Typical Δp-Q curves for valves AM5-FC, with mineral oil at 36cSt and 50°C and screw set at beginning of adjustment. Diagrams for flow controlled A1→A, B1→B, flow through check A→A1, B→B1, and free channels



1)A1→A and B1→B 2)A→A1 and B→B1 3)Free channels

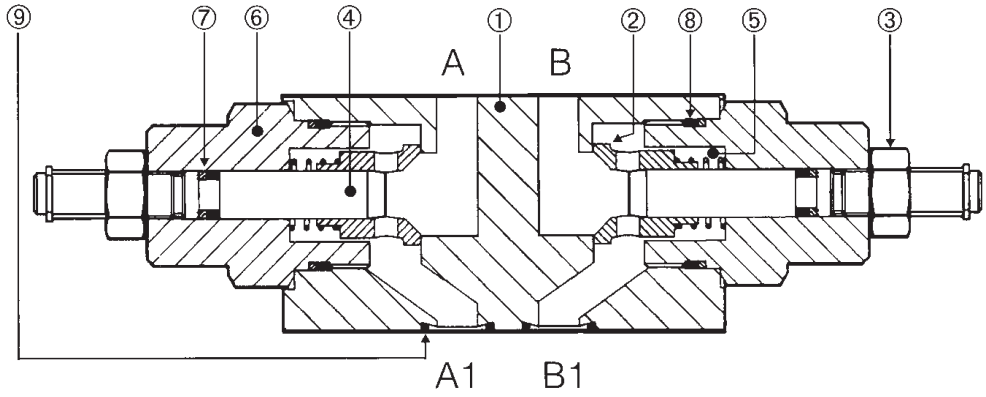
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

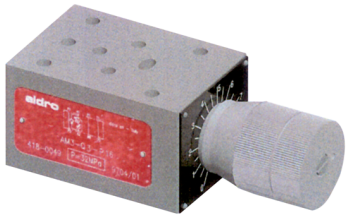
TYPICAL SECTION

1	Body	6	Shaft's holder
2	Poppet sliding	7	Seal
3	Locking nut	8	Seal
4	Throttling shaft	9	Seal
5	Spring		

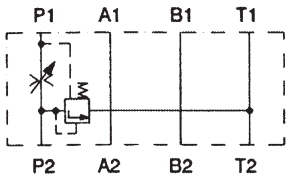


ISO 03 HYDRAULIC FLOW CONTROL VALVES type AM3-Q3
3-WAY PRESSURE COMPENSATED

- 3-way flow control valves, pressure compensated
- **ISO 03** interface, stackable assembly
- Designed to provide adjustable controlled flow rates independent of changes in system pressure
- Max operating pressure : 320 bar
- Max recommended flow: 40 l/min
- Max flow rate on port P: 16 l/min
- Mass: 0,8kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt



SYMBOL



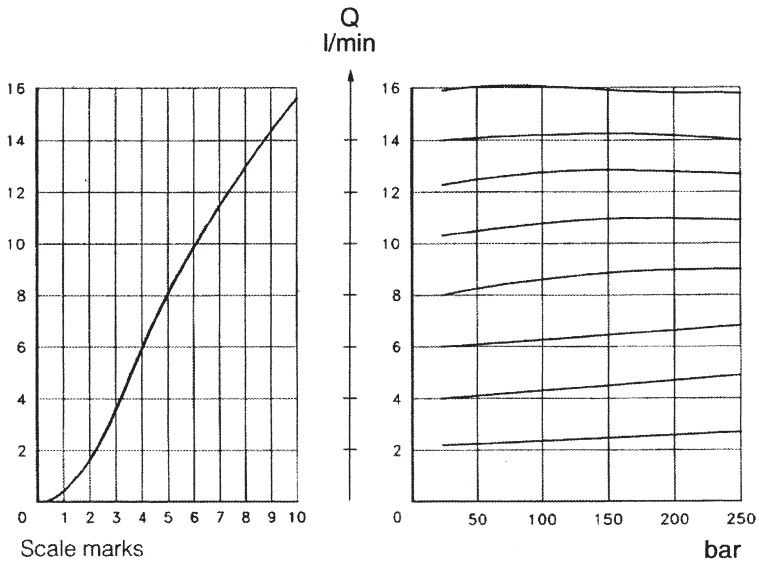
When the inlet flow (at P1) is more than regulated value, the excess is discharged at T line

ORDERING CODE

AM3 – Q3 – P / 16

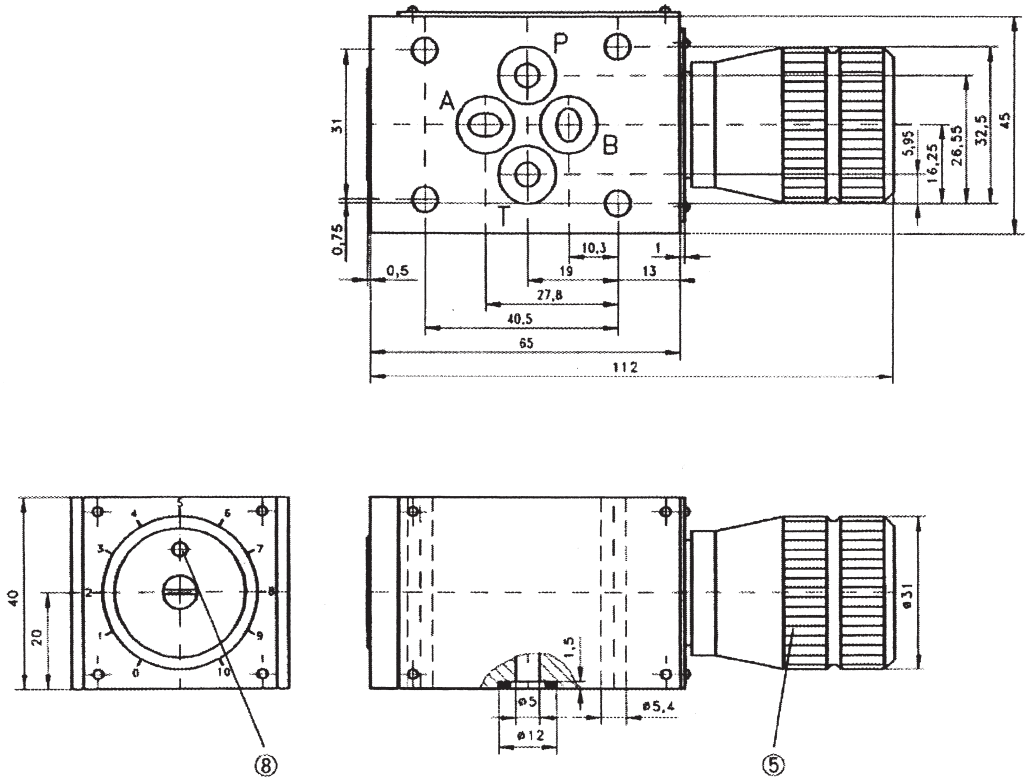
AM3	ISO 03 stackable valve
Q3	3-way flow control valve, pressure compensated
P	Control on port P
16	16 l/min – max regulated flow control rate to P

TYPICAL DIAGRAM



Typical adjustment curves (Q-marks and Q-P) for valves AM3-Q3-P/16, with mineral oil at 36cSt and 50°C

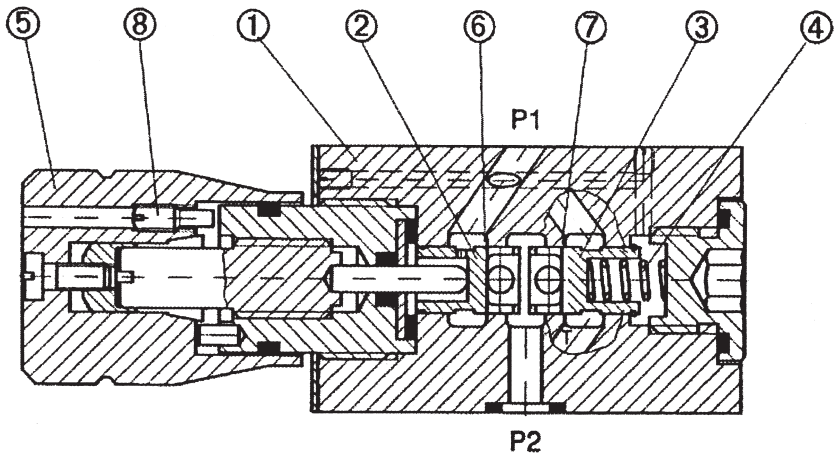
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

TYPICAL SECTION

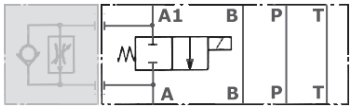
1	Body	5	Hand knob
2	Throttling spool	6	Throttling spool orifice
3	Pressure compensator	7	Pressure compensator orifice
4	Spring	8	Fixing screw



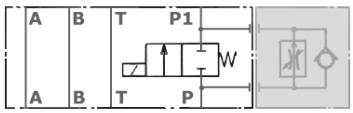
ISO 03 BY-PASS VALVES type AM3-DQ
STACKABLE TYPE - SOLENOID OPERATED

- 4-way solenoid operated by-pass valves
- **ISO 03** interface
- Suitable for flow control valves type QVC-06 (see table QV-325)
- Nominal flow rate: 32 l/min (free flow)
- Maximun pressure: 250 bar
- 100% duty cycle
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



AC



PC

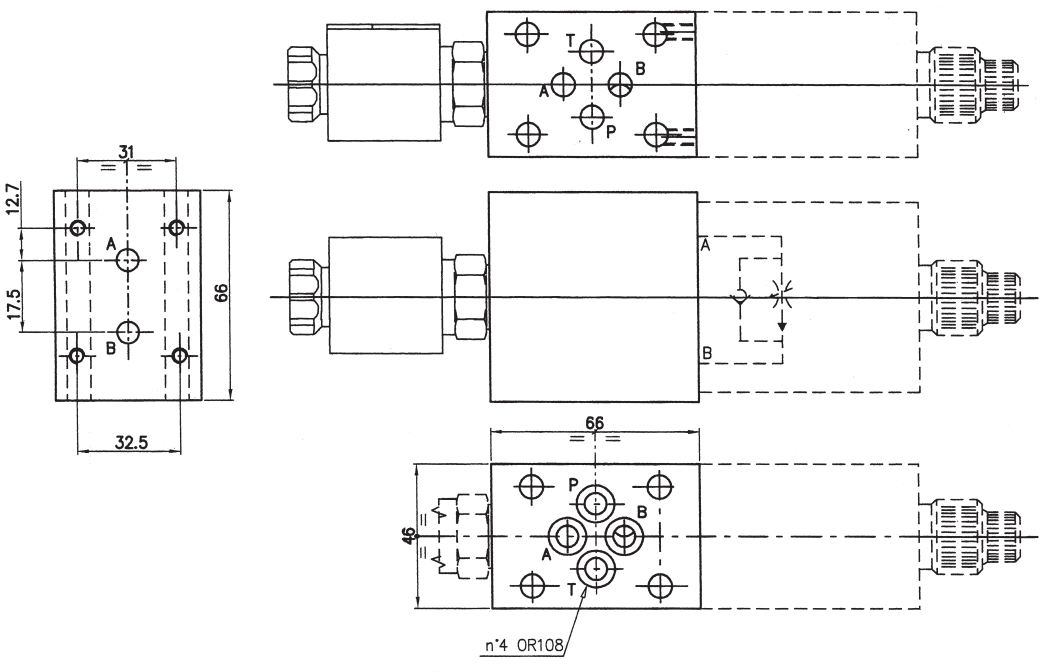
Available on request
with meter-out control on B line or T line

ORDERING CODE

AM3 – DQ – AC – 24

AM3	ISO 03 stackable valve
DQ	Adjustable flow control (valve not included)
AC	**AC** : normally closed, meter-out A **PC** : normally closed, meter-in P
24	Standard coil woltage: 12 - 12V DC (see coil C30-012C tab AC-100) 24 - 24V DC (see coil C30-024C tab AC-100)

OVERALL DIMENSIONS

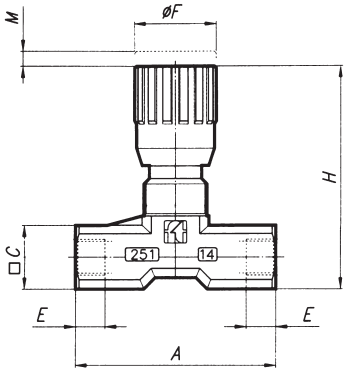


Subject to technical and dimensional changes without notice

IN-LINE FLOW CONTROL VALVES type FT

FT 251/2-S FLOW CONTROL VALVES

- Flow control valves, needle type
- **2-way flow control**, adjustable
- BSP thread ports for in-line assembly
- **Steel** body, poppet and spring in steel
- Maximum operating pressure: **400 bar**
- Adjustment hand-grip with locking screw

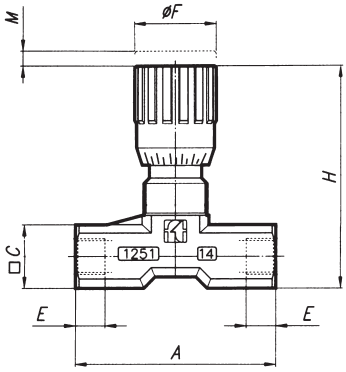


PERFORMANCE DATA									
ORDERING CODE	Symbol	Ports	Q_{MAX} (l/min)	A	C	E	ØF	H	M
FT 251/2-S-14		1/4“ BSP	16	46	17	12	22	61	4,5
FT 251/2-S-38		3/8” BSP	30	55	22	13	27	74	7
FT 251/2-S-12		1/2” BSP	60	70	27	16	33	85,5	10

Subject to technical and dimensional changes without notice
Available on request port sizes 3/4” BSP, 1” BSP, 1-1/4” BSP, 1-1/2” BSP

FT 1251/2-01 FLOW CONTROL VALVES

- Flow control valves, needle type
- **2-way flow control**, adjustable
- BSP thread ports for in-line assembly
- **Brass** body, poppet and spring in steel
- Maximum operating pressure: **210 bar**
- High adjustment accuracy due to its precision hand-grip with locking screw

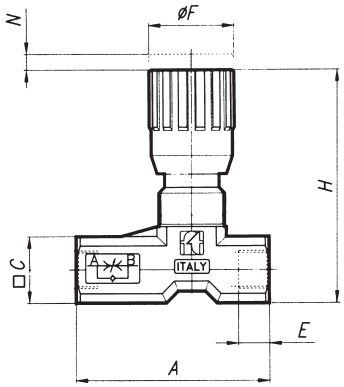


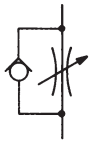
PERFORMANCE DATA									
ORDERING CODE	Symbol	Ports	Q_{MAX} (l/min)	A	C	E	ØF	H	M
FT 1251/2-01-14		1/4“ BSP	16	46	17	12	22	57	4,5
FT 1251/2-01-38		3/8” BSP	30	55	22	13	27	69	7
FT 1251/2-01-12		1/2” BSP	60	70	27	16	33	82	10

Subject to technical and dimensional changes without notice
Available on request port sizes 3/4” BSP, 1” BSP, 1-1/4” BSP, 1-1/2” BSP

FT 251/5-S FLOW CONTROL VALVES

- Flow control valves, needle type
- **1-way flow control**, adjustable
- BSP thread ports for in-line assembly
- **Steel** body, poppet and spring in steel
- Maximum operating pressure: **400 bar**
- Adjustment hand-grip with locking screw

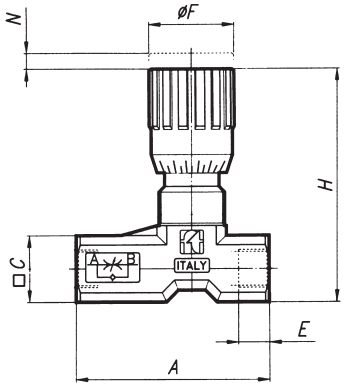


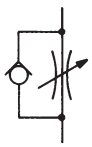
PERFORMANCE DATA									
ORDERING CODE	Symbol	Ports	Q_{MAX} (l/min)	A	C	E	ØF	H	M
FT 251/5-S-14		1/4“ BSP	16	56	17	12	22	61	4,5
FT 251/5-S-38		3/8” BSP	30	64,5	22	13	27	74	7
FT 251/5-S-12		1/2” BSP	60	87	27	16	33	85,5	10

Subject to technical and dimensional changes without notice
Available on request port sizes 3/4” BSP, 1” BSP, 1-1/4” BSP, 1-1/2” BSP

FT 1251/5-01 FLOW CONTROL VALVES

- Flow control valves, needle type
- **1-way flow control**, adjustable
- BSP thread ports for in-line assembly
- **Brass** body, poppet and spring in steel
- Maximum operating pressure: **210 bar**
- High adjustment accuracy due to its precision hand-grip with locking screw



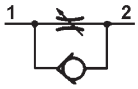
PERFORMANCE DATA									
ORDERING CODE	Symbol	Ports	Q_{MAX} (l/min)	A	C	E	ØF	H	M
FT 1251/5-01-14		1/4“ BSP	16	56	17	12	22	57	4,5
FT 1251/5-01-38		3/8” BSP	30	64,5	22	13	27	69	7
FT 1251/5-01-12		1/2” BSP	60	87	27	16	33	82	10

Subject to technical and dimensional changes without notice
Available on request port sizes 3/4” BSP, 1” BSP, 1-1/4” BSP, 1-1/2” BSP

HYDRAULIC SCREW-IN FLOW CONTROL VALVES type FT266 / VCF
NOT COMPENSATED - ADJUSTABLE

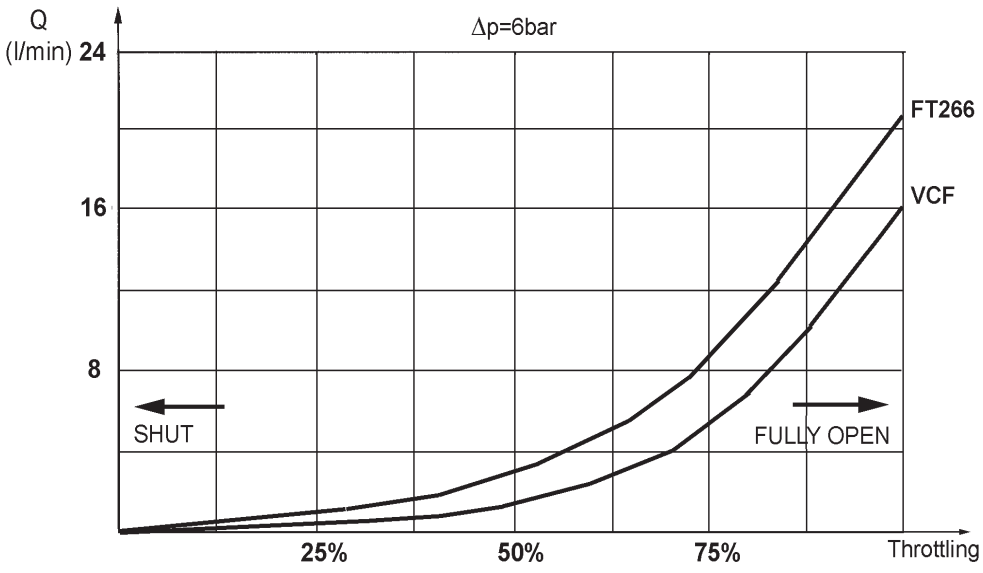
- Throttle adjustable valves
- Suitable for standard cavity **3/4" 16 UNF**
- 1 or 2-way flow, not compensated
- Maximum operating pressure: 250 bar
- High adjustment accuracy due to its precision hand-grip with locking screw (FT types)
- Steel body
- Needle in hardened and grinded steel

TECHNICAL DATA

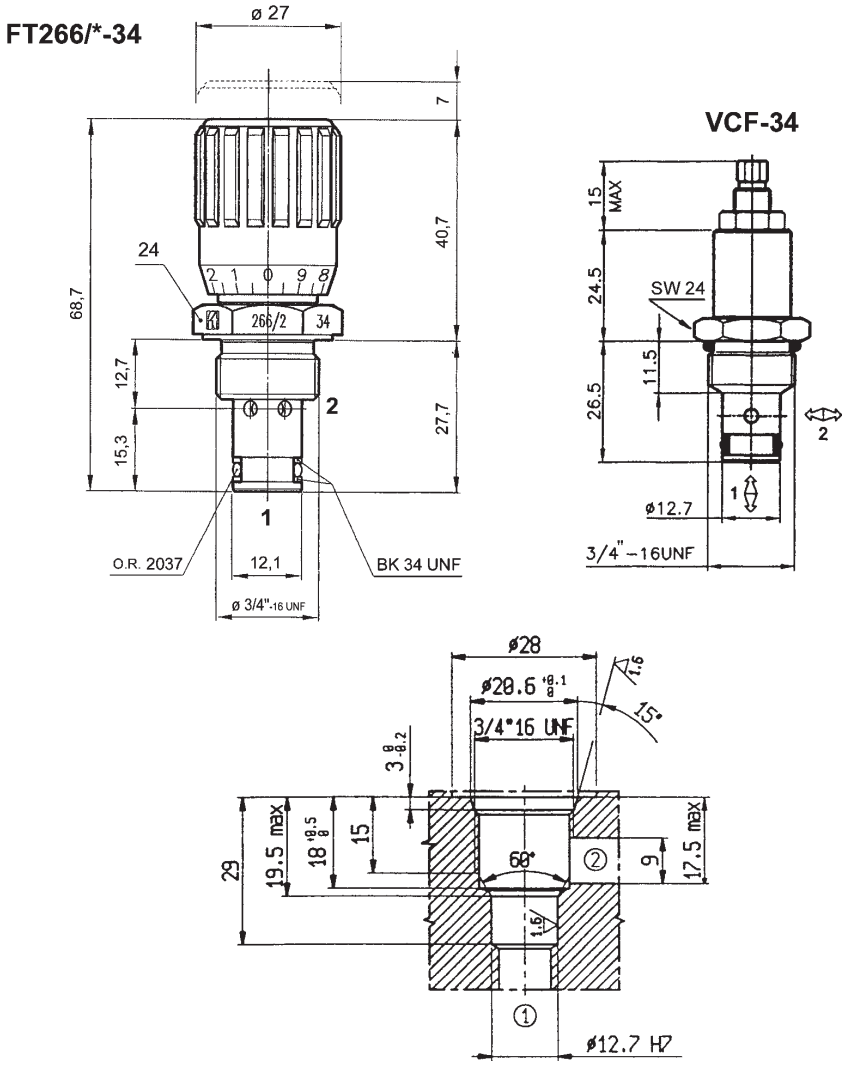
ORDERING CODE	SYMBOL	Q_{MAX} [l/min]	P_{MAX} [bar]	CAVITY	MASS [kg]
FT 266/5-34		20	250	3/4" 16 UNF	0,15
FT 266/2-34					0,13
VCF-34		16			0,12

TYPICAL DIAGRAM

Typical **Q** curves at different throttling sections and fixed **Δp=6 bar** for valves FT 266 / VCF.

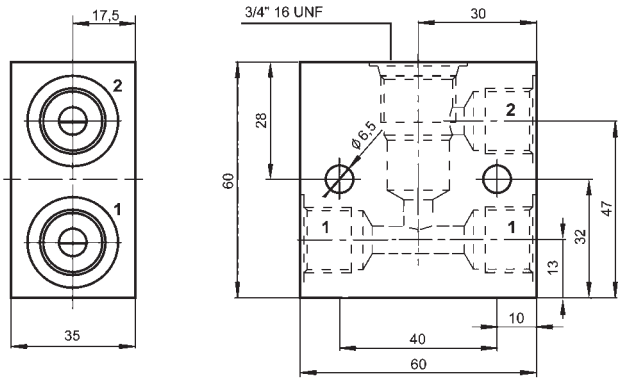


OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY



Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN FLOW CONTROL VALVES type VQF
PRESSURE COMPENSATED - FIXED FLOW RATE

- 2-way pressure compensated flow control valve
- Suitable for standard cavity **3/4" 16 UNF**
- Not adjustable type: available in different fixed delivery rates (from 1 to 12 l/min – accuracy: ±10% at 100 bar)
- Maximum operating pressure: 250 bar
- Reverse flow through the same regulating orifice, without pressure compensation
- Steel body
- Poppet in hardened and grinded steel

SYMBOL

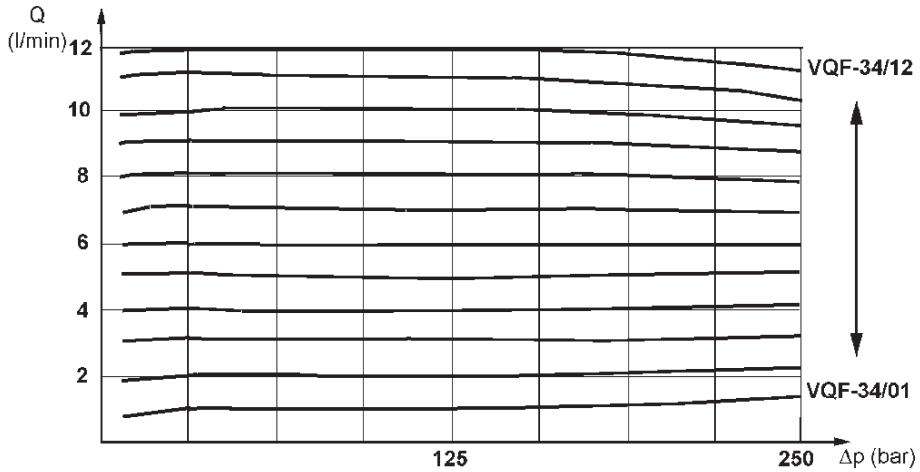
ORDERING CODE

VQF – 34 / **

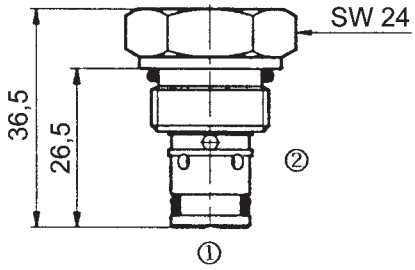
VQF	Pressure compensated flow control valve	
34	Size (3/4" 16 UNF)	
**	Flow rate:	
	01 – 1 l/min	07 – 7 l/min
	02 – 2 l/min	08 – 8 l/min
	03 – 3 l/min	09 – 9 l/min
	04 – 4 l/min	10 – 10 l/min
	05 – 5 l/min	11 – 11 l/min
	06 – 6 l/min	12 – 12 l/min

TYPICAL DIAGRAM

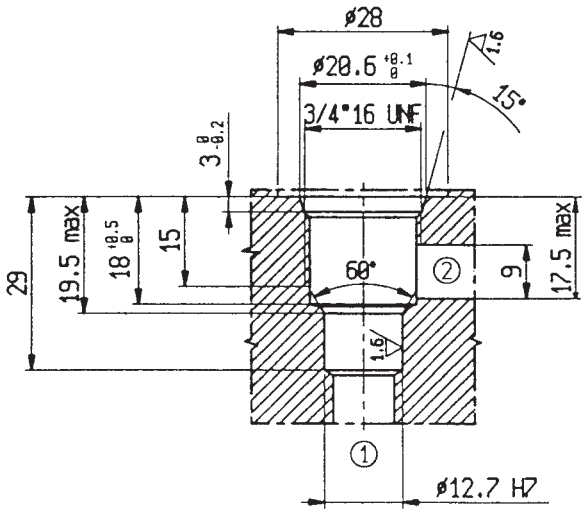
Typical **Δp-Q** curves for valves **VQF-34/**** in standard configuration, with mineral oil at 42cSt and 50°C for flow 1→2



OVERALL DIMENSIONS

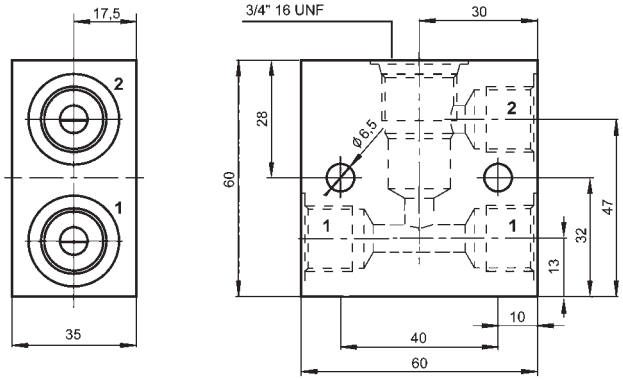


Tightening torque 40-45Nm



Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY



Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4" 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

HYDRAULIC SCREW-IN FLOW CONTROL VALVES type FT268/2 PRESSURE COMPENSATED - ADJUSTABLE

- 2-way adjustable flow control valve, pressure compensated
- Suitable for standard cavity **3/4" 16 UNF**
- Maximum recommended flow: 20 l/min
- Maximum operating pressure: 250 bar
- High adjustment accuracy due to its precision hand-grip with locking screw
- Steel body
- Poppet in hardened and grinded steel
- Mass: 0,2 kg

SYMBOL

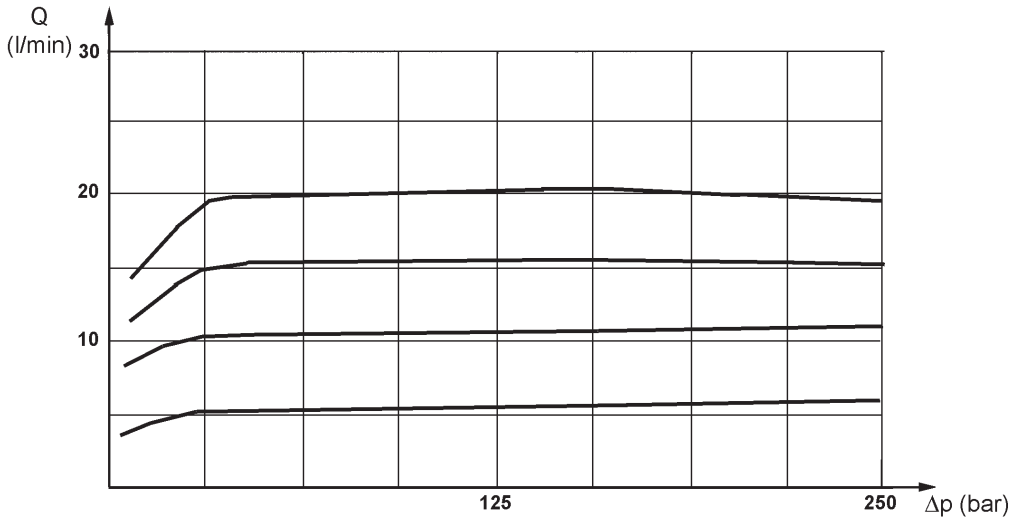
ORDERING CODE

FT 268/2 - 34

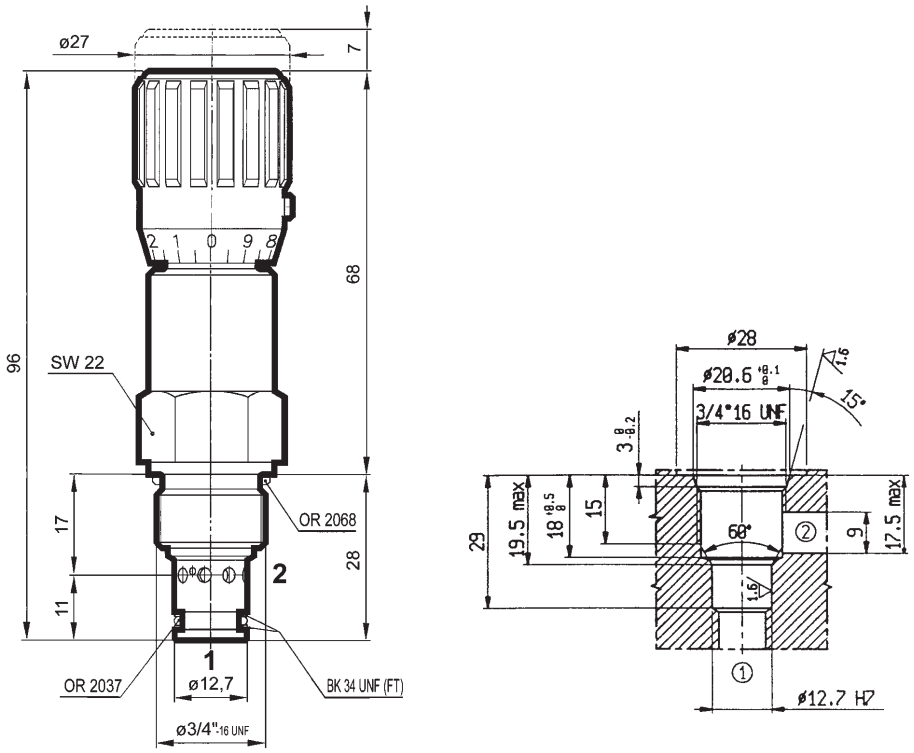
FT 268/2	Screw-in adjustable flow control valve, pressure compensated
34	Size (3/4" 16 UNF)

TYPICAL DIAGRAM

Typical **Δp-Q** curves at different regulated flows for valves **FT 268/2** in standard configuration, with mineral oil at 42cSt and 50°C

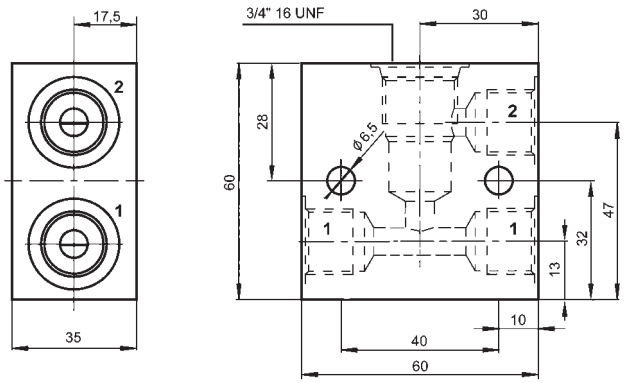


OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

LINE ASSEMBLY BODY

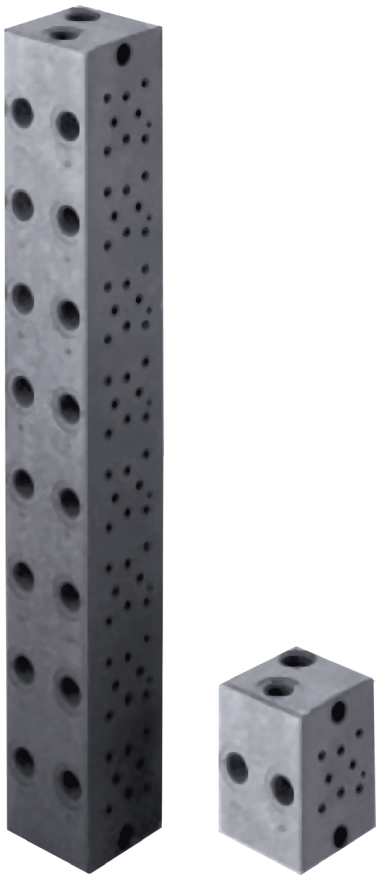


Code	Ports
LAB-34-2/14	1/4“ BSP
LAB-34-2/38	3/8“ BSP
Mass: 0,25 kg	

Suitable for standard 2-way screw-in valves, cavity 3/4“ 16 UNF.
Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.

MANIFOLDS AND BLOCKS

ISO 02 MANIFOLDS type PM2
SIDE PORTS



- A and B ports (1/4" BSP) side position
- P and T ports (1/4" e 3/8" BSP) pass-through on terminal surfaces
- Internal P and T parallel link type

- Manifolds 1 to 8 stations for oil hydraulic 4-way valves, ISO 02 interface.

- **Material:** carbon steel (PM2-SL), aluminium (PM2-AL)
- **Surface:** black manganese phosphating (PM2-SL), anodization (PM2-AL)

- **P max:** P, A, B and T = 320 bar (PM2-SL), 250 bar (PM2-AL)

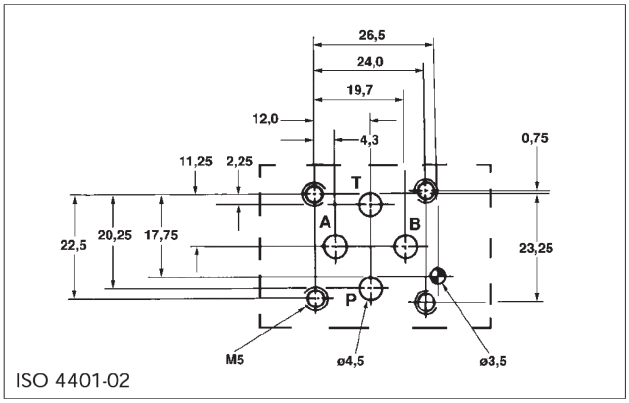
- **Max recommended flow:** 36 l/min, decreasing with the number of stations.

- **Ports:** female BSP cylindrical threads, with perpendicularity surface at Ra max 1,6, for assembly of standardized fittings.

A and B: 1/4" BSP. One couple each station.

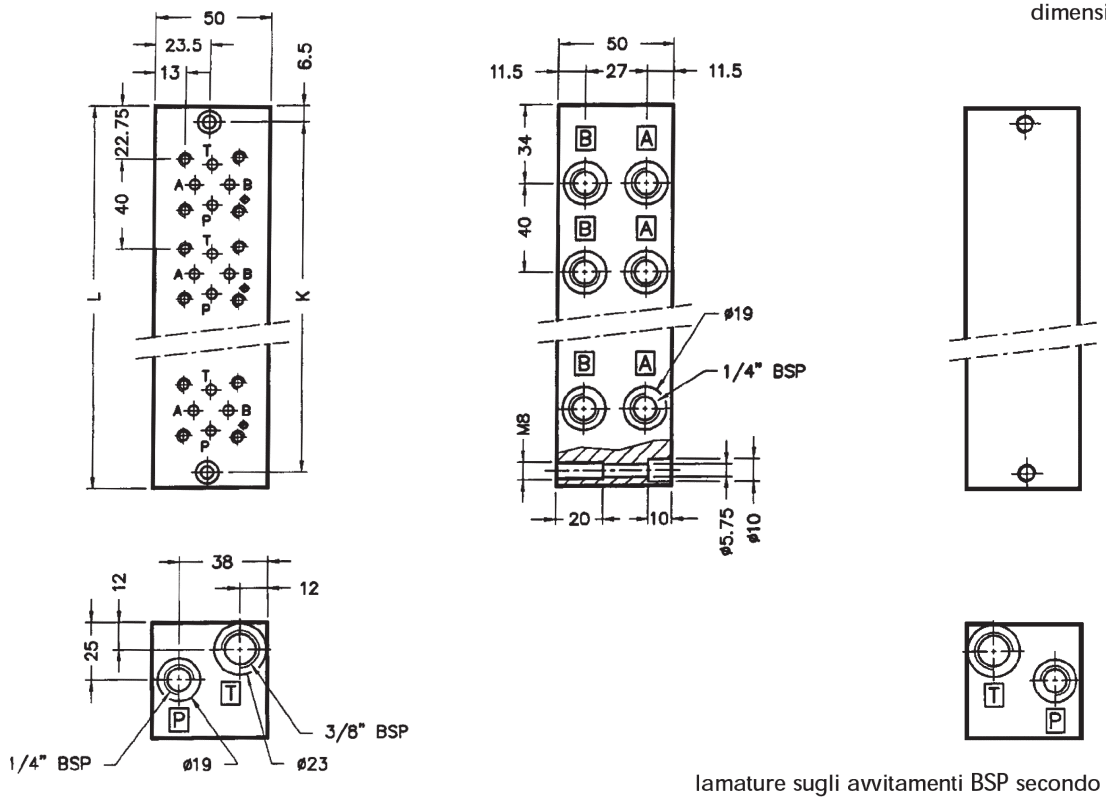
P and T: 1/4" and 3/8" BSP. Two couples on terminal faces. They allow, if required, a double inlet (P) or a double discharge (T). Ports unused have to be plugged.
(*) By using both couples of ports P and T, the "Qmax recommended" valves can be increased.

Type	ISO 02 Station	Qmax recommended (*) l/min
PM2-SL-1	1	36
PM2-SL-2	2	36
PM2-SL-3	3	32
PM2-SL-4	4	32
PM2-SL-5	5	25
PM2-SL-6	6	25
PM2-SL-7	7	20
PM2-SL-8	8	20



ISO 4401-02

dimensioni in mm



Iamature sugli avvitamenti BSP secondo DIN 3852

Type	L (mm)	K (mm)	mass (kg)
PM2-SL-1	68	55	1,0
PM2-SL-2	108	95	1,7
PM2-SL-3	148	135	2,3
PM2-SL-4	188	175	2,9
PM2-AL-5	228	215	1,2
PM2-AL-6	268	255	1,4
PM2-AL-7	308	295	1,6
PM2-AL-8	348	335	1,8

- **Manifold mounting:**
  • 2 holes Ø 5,5 mm pass-through, with internal seat Ø 10x10 mm for screw's head
  • 4 threaded holes M8 on rear face

- **Valves' assembly interface:**
  Planarity: 0,01/100
  : Ra 0,8
  Each position has a pin hole, according to ISO 4401-02, to allow unique direction of assembly.

ISO 03 MANIFOLDS type MR3
SIDE PORTS

- A and B ports (3/8" BSP) side position
- P and T ports (1/2" BSP) pass-through on terminal surfaces
- Internal P and T parallel link type

- Manifolds 1 to 8 stations for oil hydraulic 4-way valves, ISO 03 interface.

- **Material:** cast iron GG 25
- **Surface:** manganese black phosphating

- **P max:** P, A, B and T = 300 bar

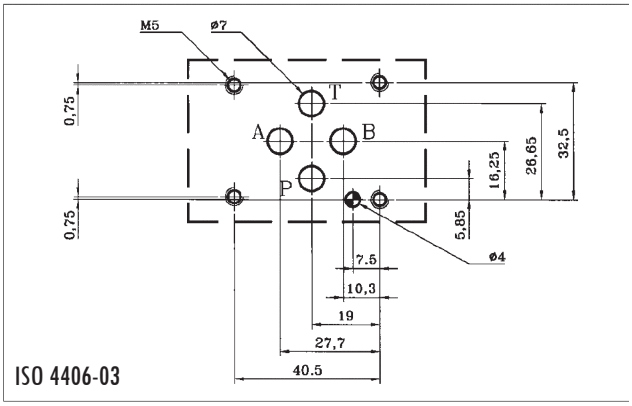
- **Max recommended flow:** 40 up to 80 l/min, decreasing with the number of stations.

- **Ports:** female BSP cylindrical threads, with perpendicularity surface at Ra max 1,6, for assembly of standardized fittings.

  A and B: 3/8" BSP. One couple each station.

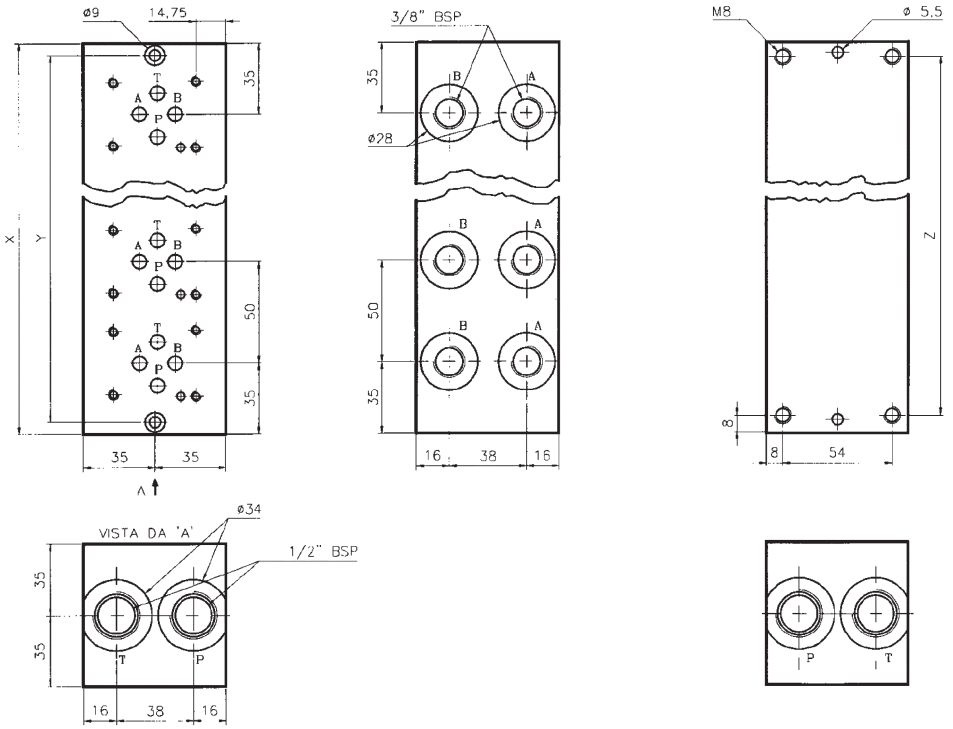
  P and T: 1/2" BSP. Two couples on terminal faces. They allow, if required, a double inlet (P) or a double discharge (T). Ports unused have to be plugged.
  (*) By using both couples of ports P and T, the "Qmax recommended" valves can be increased.

Type	ISO 03 Station	Qmax recommended (*) l/min
MR3-1G	1	80
MR3-2G	2	80
MR3-3G	3	60
MR3-4G	4	60
MR3-5G	5	50
MR3-6G	6	50
MR3-7G	7	40
MR3-8G	8	40



ISO 4406-03

dimensioni in mm



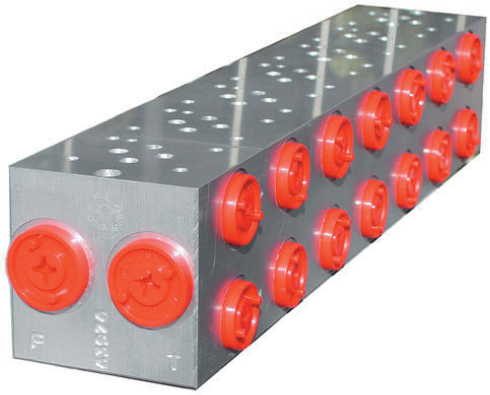
Iamature sugli avvitamenti BSP secondo DIN 3852

Type	X (mm)	Y (mm)	Z (mm)	mass (kg)
MR3-1G	70	58	54	2,10
MR3-2G	120	108	104	3,60
MR3-3G	170	158	154	5,20
MR3-4G	220	208	204	6,70
MR3-5G	270	258	254	8,30
MR3-6G	320	308	304	9,80
MR3-7G	370	358	354	11,40
MR3-8G	420	408	404	13,00

- **Manifold mounting:**
  • 2 holes Ø 5,5 mm pass-through, with internal seat Ø 10x10 mm for screw's head
  • 4 threaded holes M8 on rear face

- **Valves' assembly interface:**
  Planarity: 0,01/100
  : Ra 0,8
  Each position has a pin hole, according to ISO 4401-02, to allow unique direction of assembly.

ISO 03 ALUMINIUM MANIFOLDS type MR3/ALU
SIDE PORTS



- A and B ports (3/8" BSP) side position
- P and T ports (1/2" BSP) pass-through on terminal surfaces
- Internal P and T parallel link type

- Manifolds 1 to 8 stations for oil hydraulic 4-way valves, ISO 03 interface.

- **Material:** aluminium
- **Surface:** anodization

- **P max:** P, A, B and T = 250 bar

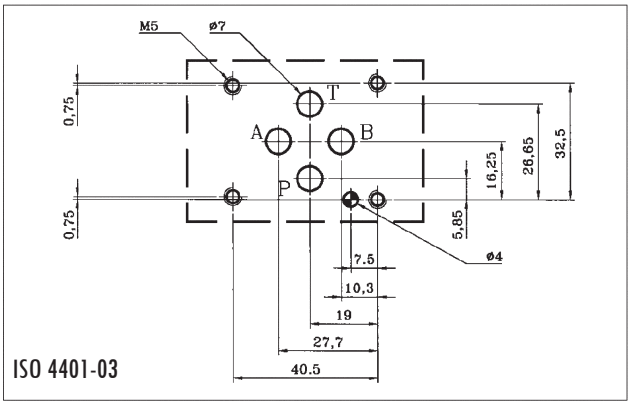
- **Max recommended flow:** 40 up to 80 l/min, decreasing with the number of stations.

- **Ports:** female BSP cylindrical threads, with perpendicularity surface at Ra max 1,6, for assembly of standardized fittings.

  A and B: 3/8" BSP. One couple each station.

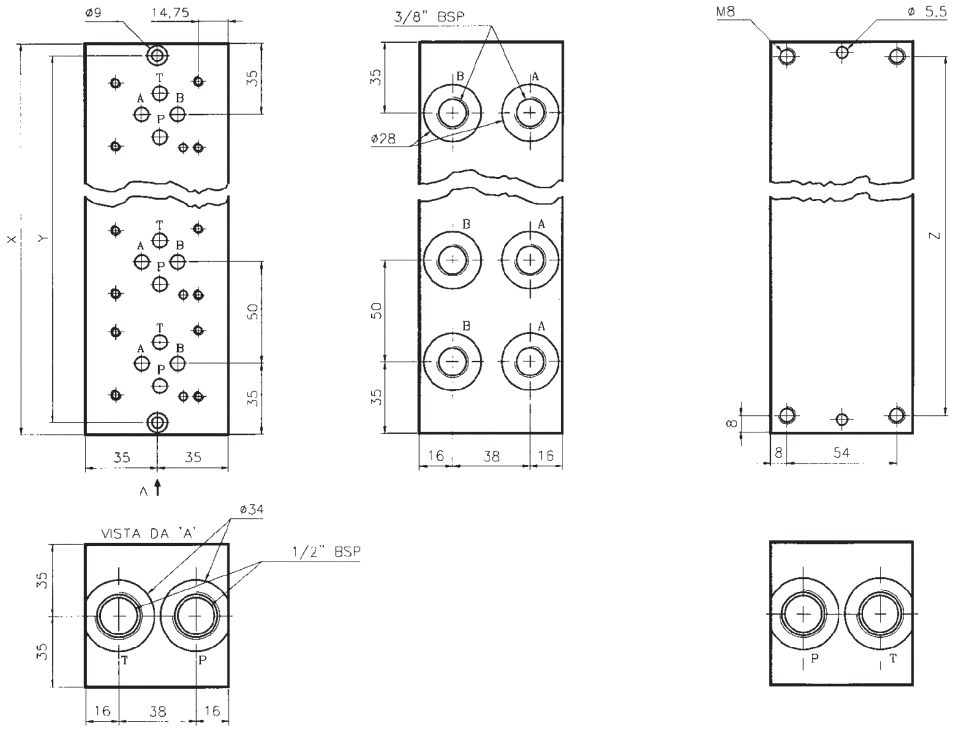
  P and T: 1/2" BSP. Two couples on terminal faces. They allow, if required, a double inlet (P) or a double discharge (T). Ports unused have to be plugged.
  (*) By using both couples of ports P and T, the "Qmax recommended" valves can be increased.

Type	ISO 03 Station	Qmax recommended (*) l/min
MR3-1G/ALU	1	80
MR3-2G/ALU	2	80
MR3-3G/ALU	3	60
MR3-4G/ALU	4	60
MR3-5G/ALU	5	50
MR3-6G/ALU	6	50
MR3-7G/ALU	7	40
MR3-8G/ALU	8	40



ISO 4401-03

dimensioni in mm



lamature sugli avvitamenti BSP secondo DIN 3852

Type	X (mm)	Y (mm)	Z (mm)	mass (kg)
MR3-1G/ALU	70	58	54	0,76
MR3-2G/ALU	120	108	104	1,40
MR3-3G/ALU	170	158	154	2,04
MR3-4G/ALU	220	208	204	2,68
MR3-5G/ALU	270	258	254	3,32
MR3-6G/ALU	320	308	304	3,96
MR3-7G/ALU	370	358	354	4,60
MR3-8G/ALU	420	408	404	5,24

- **Manifold mounting:**
  • 2 holes Ø 5,5 mm pass-through, with internal seat Ø 9x8 mm for screw's head
  • 4 threaded holes M8 on rear face

- **Valves' assembly interface:**
  Planarity: 0,01/100
  : Ra 0,8
  Each position has a pin hole, according to ISO 4401-03, to allow unique direction of assembly.

ISO 03 MANIFOLDS type MRK3
REAR PORTS

- A and B ports (3/8" BSP) rear position
- P and T ports (1/2" BSP) pass-through on terminal surfaces
- Internal P and T parallel link type

- Manifolds 2 to 8 stations for oil hydraulic 4-way valves, ISO 03 interface.

- **Material:** cast iron GG 25
- **Surface:** manganese black phosphating

- **P max:** P, A, B and T = 300 bar

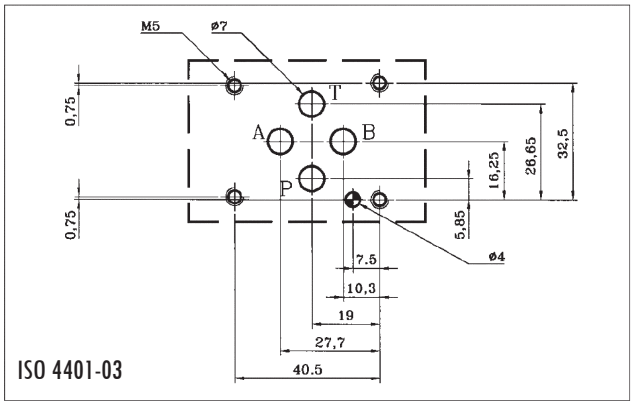
- **Max recommended flow:** 40 up to 80 l/min, decreasing with the number of stations.

- **Ports:** female BSP cylindrical threads, with perpendicularity surface at Ra max 1,6, for assembly of standardized fittings.

  A and B: 3/8" BSP. One couple each station.

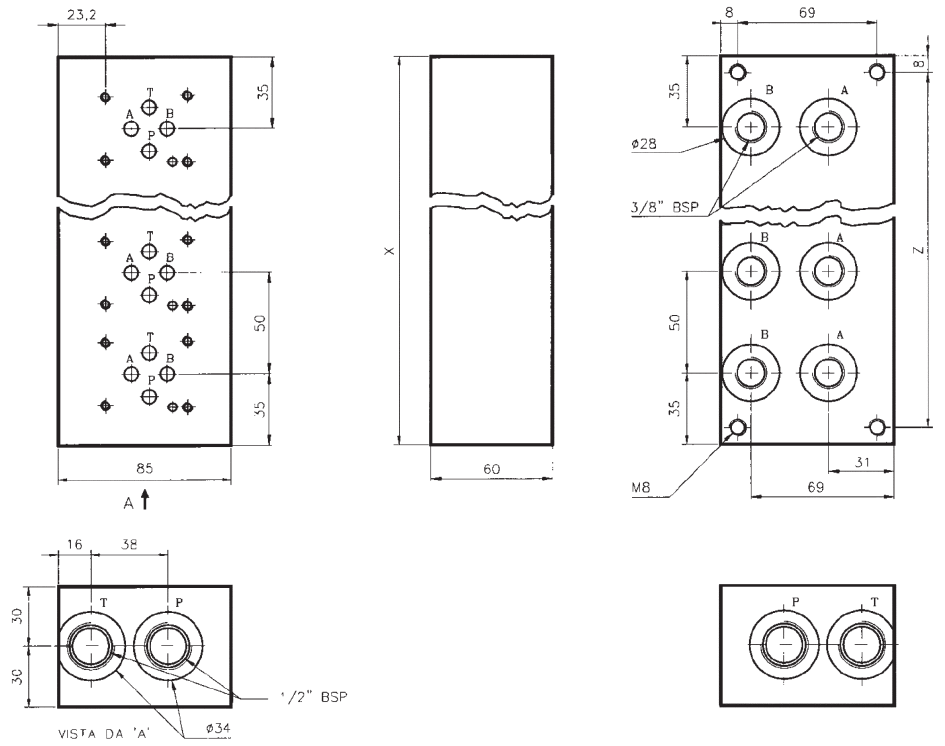
  P and T: 1/2" BSP. Two couples on terminal faces. They allow, if required, a double inlet (P) or a double discharge (T). Ports unused have to be plugged.
  (*) By using both couples of ports P and T, the "Qmax recommended" valves can be increased.

Type	ISO 03 Station	Qmax recommended (*) l/min
MRK3-2G	2	80
MRK3-3G	3	60
MRK3-4G	4	60
MRK3-5G	5	50
MRK3-6G	6	50
MRK3-7G	7	40
MRK3-8G	8	40



ISO 4401-03

dimensioni in mm



lamature sugli avvitamenti BSP secondo DIN 3852

Type	X (mm)	Z (mm)	mass (kg)
MRK3-2G	120	104	3,90
MRK3-3G	170	154	5,45
MRK3-4G	220	204	7,00
MRK3-5G	270	254	8,55
MRK3-6G	320	304	10,10
MRK3-7G	370	354	11,65
MRK3-8G	420	404	13,20

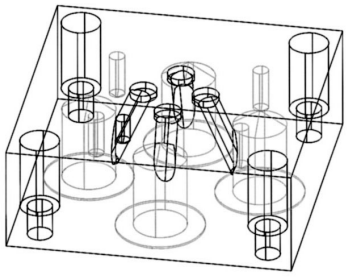
- **Manifold mounting:**
  • 4 threaded holes M8 on rear face

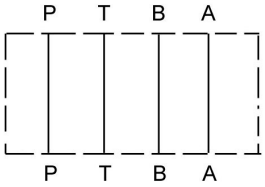
- **Valves' assembly interface:**
  Planarity: 0,01/100
  : Ra 0,8
  Each position has a pin hole, according to ISO 4401-03, to allow unique direction of assembly.

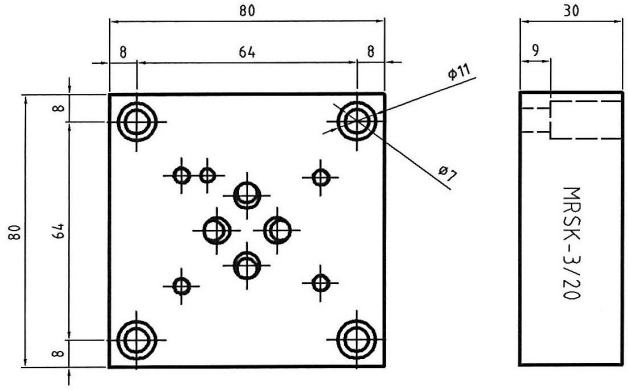
ISO 03 PLATES type MRSK-3 (drawing 20)
REAR PORTS

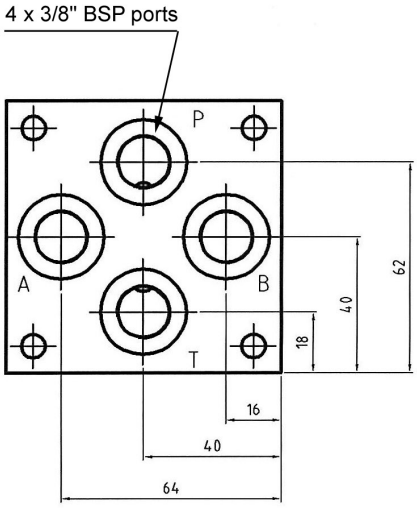
- Material: cast iron GG25, black phosphatized
- Max Pressure: 300 bar
- Max Flow rate: 60 l/min
- Mass: 1,1 kg

OVERALL DIMENSIONS



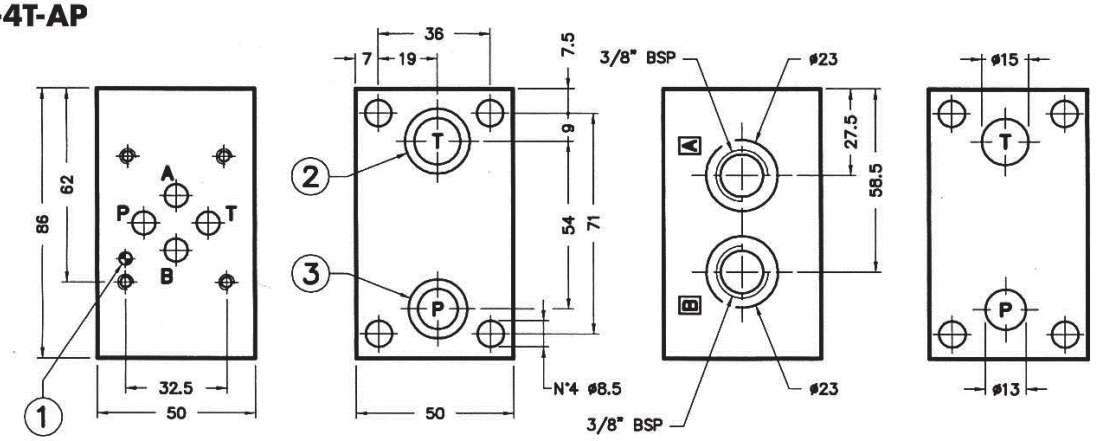






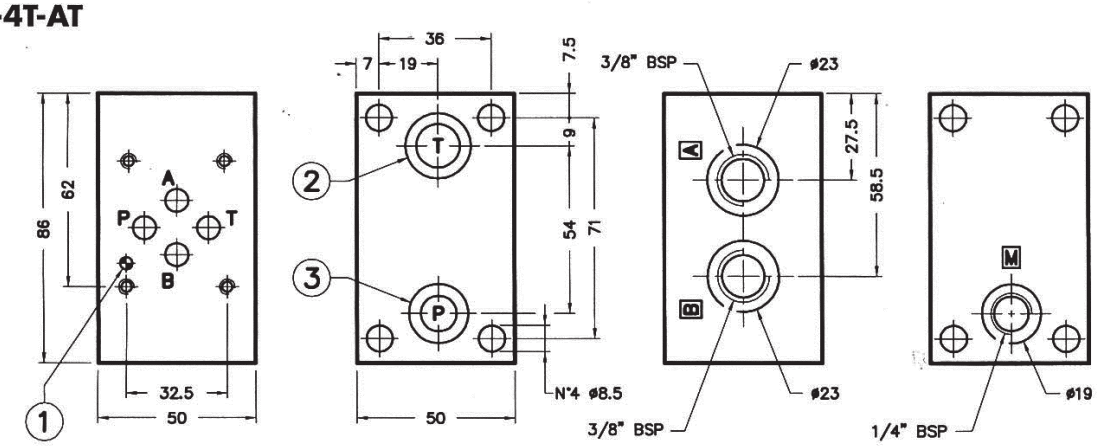
ISO 03 STACKABLE PLATES type AC-4T
INTERMEDIATE OR END

AC-4T-AP



① Sede ø 4x6 mm per eventuale spina di riferimento presente sulla valvola
② Sede ø 21x2,1 mm per guarnizione torica (es.: Tipo OR 3062)
③ Sede ø 19x2,1 mm per guarnizione torica (es.: Tipo OR 3056)

AC-4T-AT



① Sede ø 4x6 mm per eventuale spina di riferimento presente sulla valvola
② Sede ø 21x2,1 mm per guarnizione torica (es.: Tipo OR 3062)
③ Sede ø 19x2,1 mm per guarnizione torica (es.: Tipo OR 3056)

Superfici di montaggio delle valvole:
Planarità: 0,01/100
Rugosità: Ra 0,8
Dimensioni e forature in accordo a ISO 4401-03, compresa l'impronta per una spina di riferimento.

Superfici di contatto tra piastre
Planarità: 0,01/100
Rugosità: Ra 0,8
La tenuta tra le piastre è assicurata da guarnizioni di tipo OR, contenute in sedi opportunamente sagomate.

Tiranti di collegamento
Le piastre vengono collegate mediante tiranti (3 o 4) realizzati a ø 8 mm, in acciaio ad alta resistenza.
L'avvitamento dei tiranti in foro cieco o su dado, con momento torcente di circa 60 Nm, consente un solido "impaccamento" delle piastre e una giusta compressione delle guarnizioni di tenuta, tra esse interposte.

Tiranti normalizzati, filettati M8x20 mm alle estremità: T8x80; T8x130; T8x180; T8x230; T8x280; T8x330 quest'ultimo tipo di tirante consente il montaggio di 6 moduli aggiuntivi (6+1 valvole Cetop 03) che rappresenta il massimo consigliato con pressione di 250 bar.

ISO 05 MANIFOLDS type MR5
SIDE PORTS

- A and B ports (1/2" BSP) side position
- P and T ports (3/4 and 1" BSP) pass-through on terminal surfaces
- Internal P and T parallel link type

- Manifolds 2 to 8 stations for oil hydraulic 4-way valves, ISO 05 interface.

- **Material:** cast iron GG 25
- **Surface:** manganese black phosphating

- **P max:** P, A, B and T = 300 bar

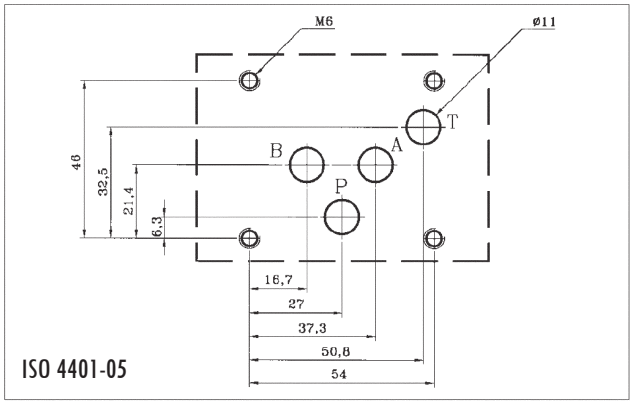
- **Max recommended flow:** 80 up to 120 l/min, decreasing with the number of stations.

- **Ports:** female BSP cylindrical threads, with perpendicularity surface at Ra max 1,6, for assembly of standardized fittings.

  A and B: 1/2" BSP. One couple each station.

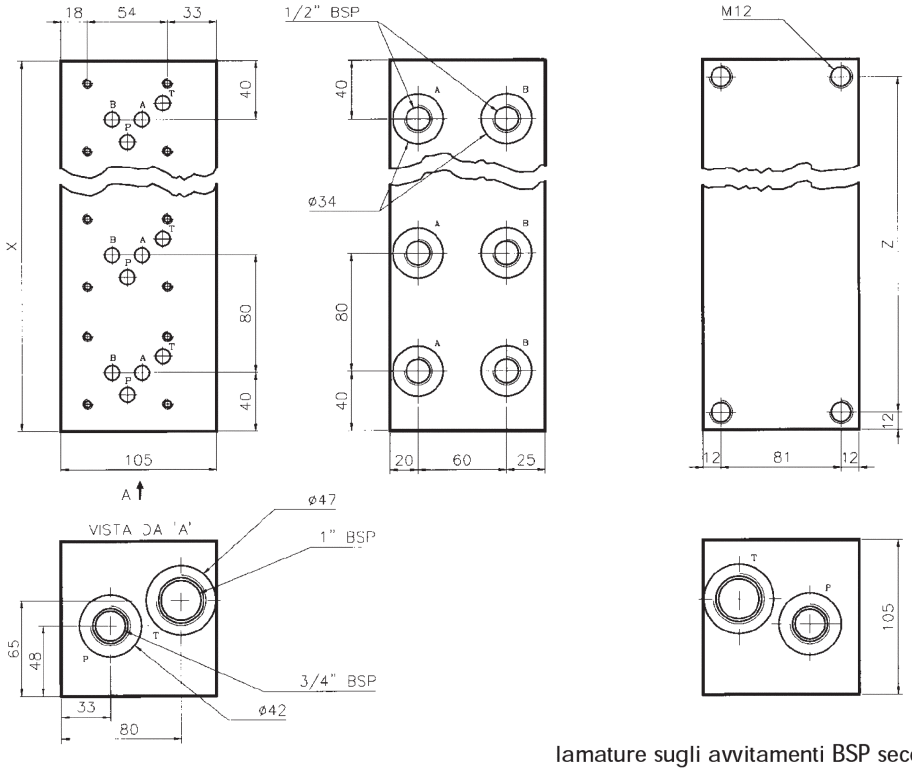
  P: 3/4" BSP and T: 1" BSP. Two couples on terminal faces. They allow, if required, a double inlet (P) or a double discharge (T). Ports unused have to be plugged.
  (*) By using both couples of ports P and T, the "Qmax recommended" valves can be increased.

Type	ISO 05 Station	Qmax recommended (*) l/min
MR5-2G	2	120
MR5-3G	3	100
MR5-4G	4	100
MR5-5G	5	100
MR5-6G	6	100
MR5-7G	7	80
MR5-8G	8	80



ISO 4401-05

dimensioni in mm



lamature sugli avvitamenti BSP secondo DIN 3852

Type	X (mm)	Z (mm)	mass (kg)
MR5-2G	160	136	11,30
MR5-3G	240	216	17,00
MR5-4G	320	296	22,70
MR5-5G	400	376	28,50
MR5-6G	480	456	34,20
MR5-7G	560	536	39,90
MR5-8G	640	616	45,60

- **Manifold mounting:**
  • 4 threaded holes M12 on rear face

- **Valves' assembly interface:**
  Planarity: 0,01/100
  : Ra 0,8

ISO 05 MANIFOLDS type MRK5
REAR PORTS

- A and B ports (1/2" BSP) rear position
- P and T ports (3/4" and 1" BSP) pass-through on terminal surfaces
- Internal P and T parallel link type

- Manifolds 2 to 8 stations for oil hydraulic 4-way valves, ISO 05 interface.

- **Material:** cast iron GG 25
- **Surface:** manganese black phosphating

- **P max:** P, A, B and T = 300 bar

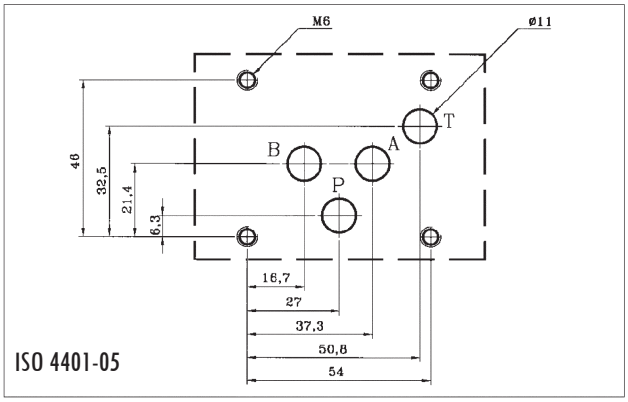
- **Max recommended flow:** 80 up to 120 l/min, decreasing with the number of stations.

- **Ports:** female BSP cylindrical threads, with perpendicularity surface at Ra max 1,6, for assembly of standardized fittings.

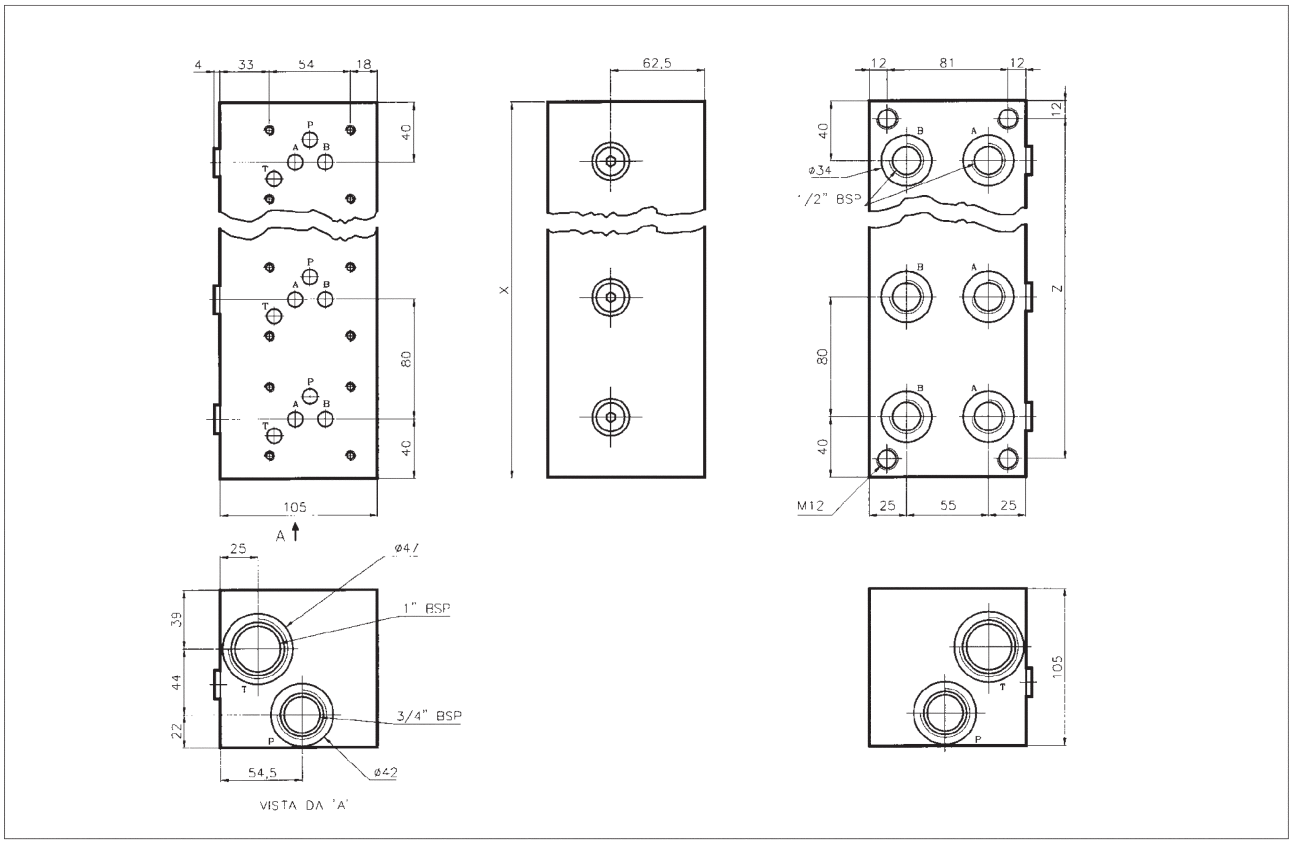
  A and B: 1/2" BSP. One couple each station.

  P: 3/4" BSP and T: 1" BSP. Two couples on terminal faces. They allow, if required, a double inlet (P) or a double discharge (T). Ports unused have to be plugged.
  (*) By using both couples of ports P and T, the "Qmax recommended" valves can be increased.

Type	ISO 05 Station	Qmax recommended (*) l/min
MRK5-2G	2	120
MRK5-3G	3	100
MRK5-4G	4	100
MRK5-5G	5	100
MRK5-6G	6	100
MRK5-7G	7	80
MRK5-8G	8	80



ISO 4401-05



Type	X (mm)	Z (mm)	mass (kg)
MRK5-2G	160	136	11,30
MRK5-3G	240	216	17,00
MRK5-4G	320	296	22,70
MRK5-5G	400	376	28,50
MRK5-6G	480	456	34,20
MRK5-7G	560	536	39,90
MRK5-8G	640	616	45,60

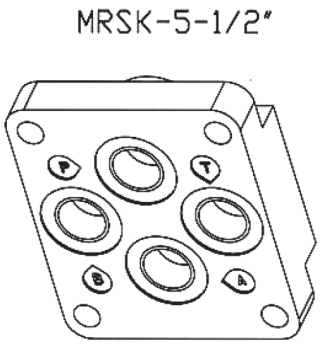
- **Manifold mounting:**
  • 4 threaded holes M12 on rear face

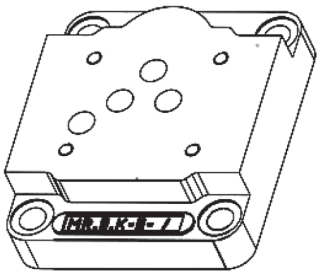
- **Valves' assembly interface:**
  Planarity: 0,01/100
  : Ra 0,8

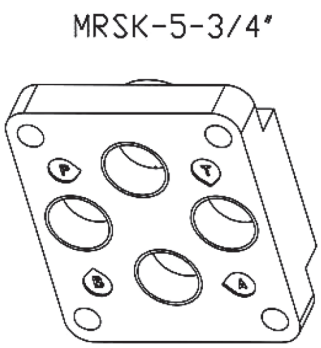
ISO 05 PLATES type MRSK-5
REAR PORTS

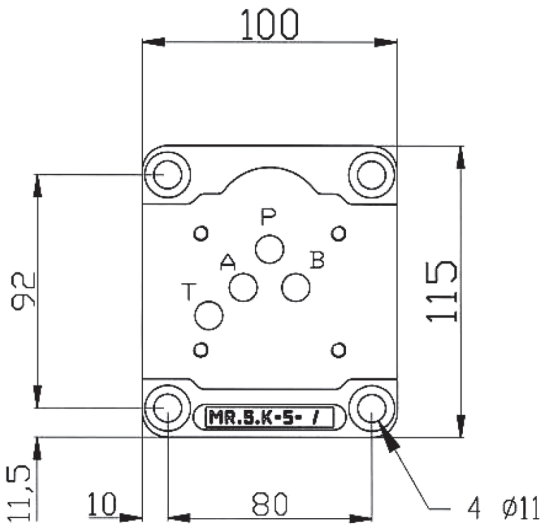
- Material: hydraulic quality cast iron phosphated
- Pressure: 300 bar max

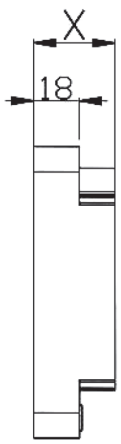
OVERALL DIMENSIONS

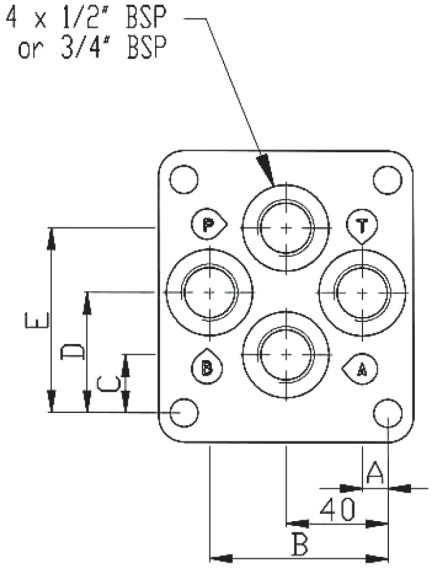


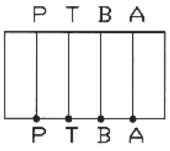












Ports	X	A	B	C	D	E	Flow rate max [l/min]	Mass [kg]
1/2"	32	10	70	23	47,5	73	100	1,90
3/4"	31	9	71	21	48	75	120	1,70

LINE ASSEMBLY BODIES type LAB FOR SCREW-IN VALVES

- Suitable for standard 2-way, 3-way and 4-way screw-in cartridge valves
- Parallel assembly: all ports connected (only 2-way valves)
- Series assembly: one port n.1 plugged (only 2-way valves)
- Standard execution for 2-way valves with plug on port n.1
- Material: aluminium
- Maximum operating pressure: 350 bar
- Cavity according to UNF standards, BSP ports

ORDERING CODE

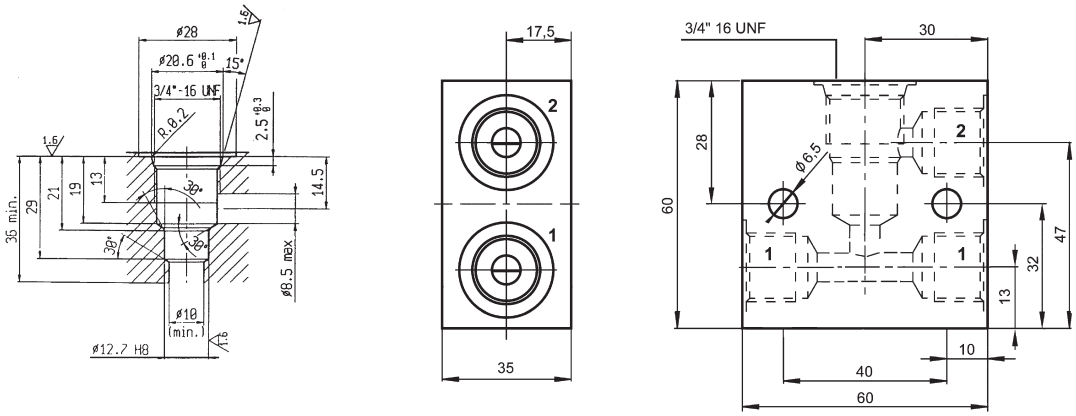
LAB-34-2/38

LAB	Line assembly body
34	**34**: Cavity 3/4" – 16 UNF **78**: Cavity 7/8" – 14 UNF
2	**2**: **2-way** valves **3**: **3-way** valves **4**: **4-way** valves
38	**14**: ports 1/4" BSP (LAB-34-2 only) **38**: ports 3/8" BSP **12**: ports 1/2" BSP (LAB-78-2 only)

OVERALL DIMENSIONS

LAB-34-2/**

Mass: 0,25 kg

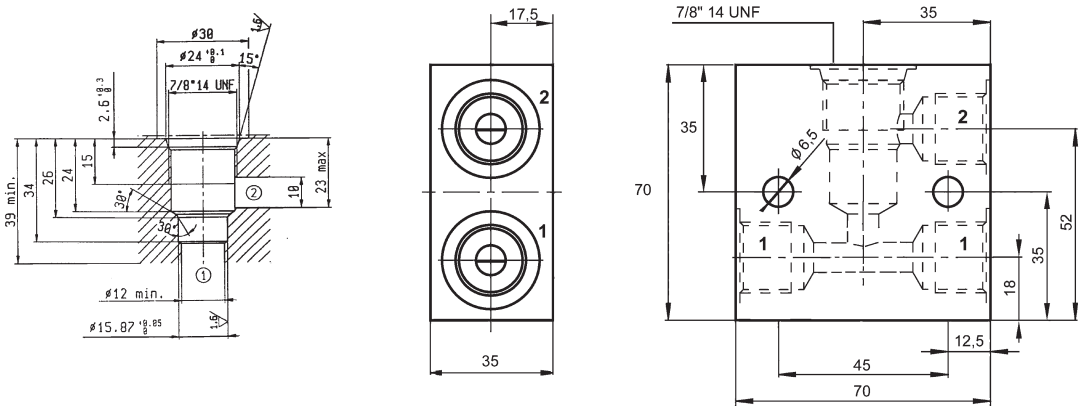


Subject to technical and dimensional changes without notice

OVERALL DIMENSIONS

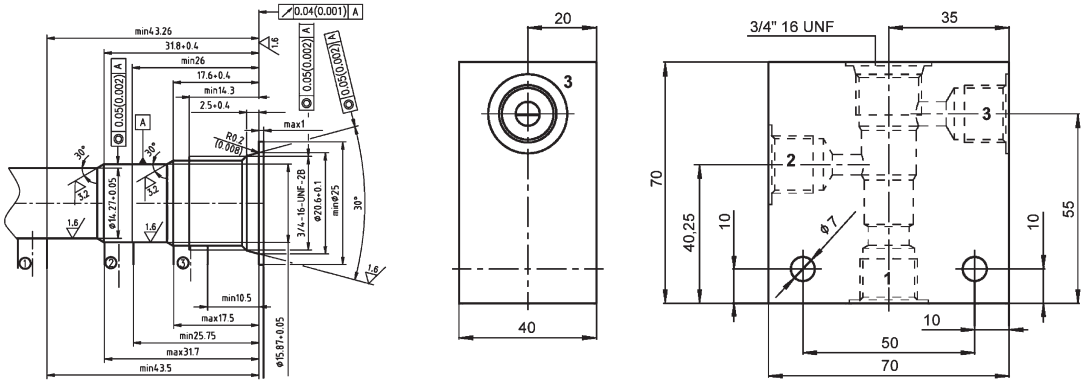
LAB-78-2/**

Mass: 0,37 kg



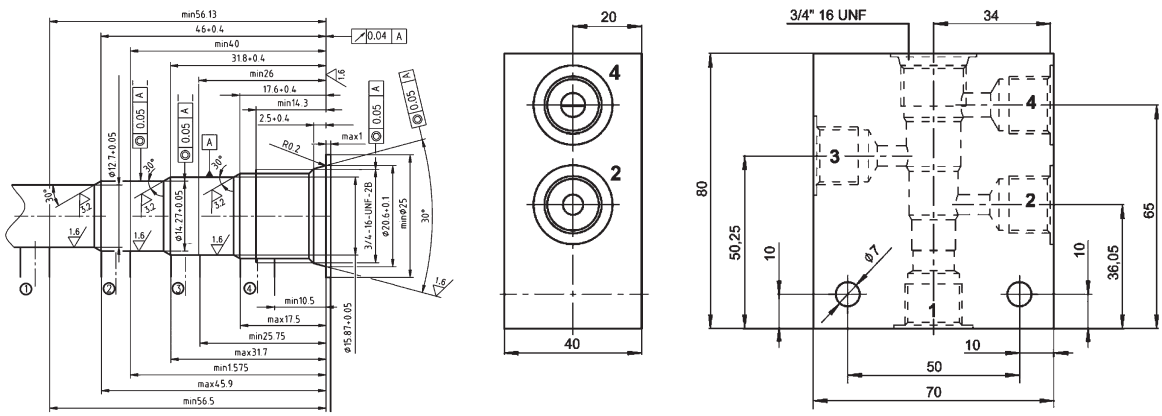
LAB-34-3/38

Mass: 0,37 kg



LAB-34-4/38

Mass: 0,54 kg



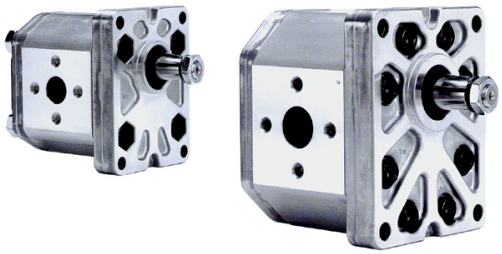
Subject to technical and dimensional changes without notice

abco

PUMPS

GEAR PUMPS type ALP

- Fixed displacement external gear pumps
- Body and plates in aluminium
- Axial hydraulic balancing
- Clockwise rotation
  (counter clockwise on request)
- Suitable for hydraulic oils according to ISO 6743/4
- Recommended oil viscosity from 20cSt to 100cSt
  (permissible from 10cSt to 800cSt) according to ISO 3448
- Temperature range from –15°C to +80°C
- Recommended fluid contamination level:
  18/16/14 according to ISO 4406/99



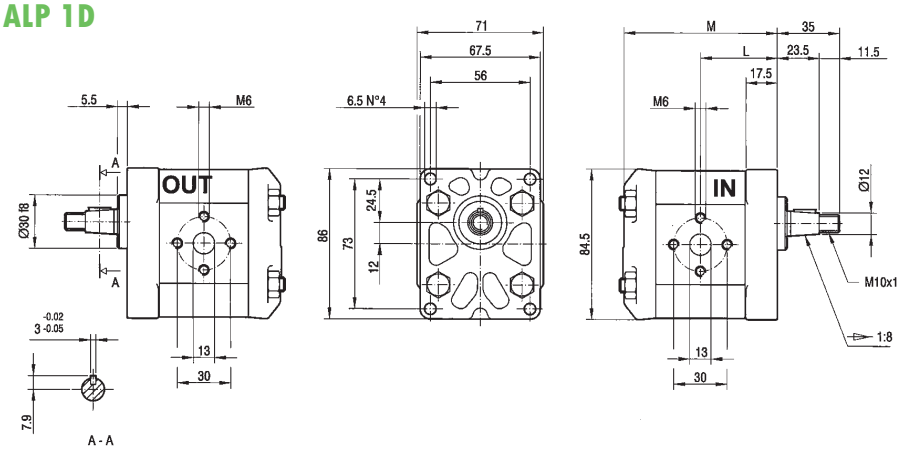
PERFORMANCE DATA

ORDERING CODE	DISPLACEMENT [cm^3/rev]	FLOW at P_{MAX} and 1500rpm [l/min]	P_{MAX} (*) [bar]	ABSORPTION at P_{MAX} and 1500rpm [kW]	N_{MAX} [rpm]	MASS [kg]
ALP 1D 2	1,4	2,0	220	0,8	6000	1,2
ALP 1D 3	2,1	2,9	220	1,2	6000	1,3
ALP 1D 4	2,8	3,9	220	1,7	5000	1,3
ALP 1D 5	3,5	4,9	220	2,1	5000	1,3
ALP 1D 6	4,1	5,9	210	2,4	4000	1,4
ALP 1D 9	6,2	8,8	200	3,3	3800	1,5
ALP 2D 10	7,0	10,0	230	4,1	4000	2,6
ALP 2D 13	9,6	13,5	220	5,6	3000	2,6
ALP 2D 16	11,5	16,0	220	6,8	4000	2,7
ALP 2D 20	14,1	20,0	210	8,0	4000	2,8
ALP 2D 25	17,9	25,0	200	9,5	3600	3,0
ALP 2D 30	21,1	29,5	180	10,0	3200	3,1
ALP 2D 40	28,2	39,5	150	11,2	2500	3,3
ALP 3D 33	22	31	230	14	3500	6,2
ALP 3D 40	26	37	230	17	3000	6,3
ALP 3D 50	33	48	220	20	3000	6,6
ALP 3D 60	39	56	220	24	3000	6,7

(*) With continuous duty cycle

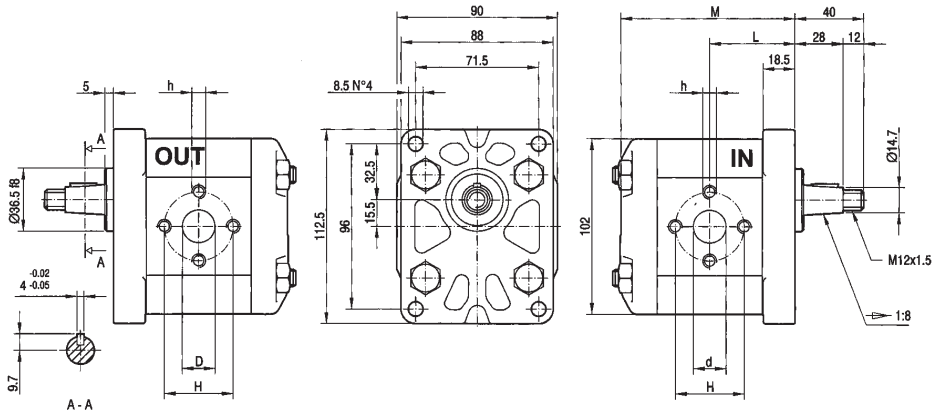
OVERALL DIMENSIONS

ALP 1D



Code	L	M
ALP 1D 2	40	80,5
ALP 1D 3	41	82,5
ALP 1D 4	42	84,5
ALP 1D 5	43	86,5
ALP 1D 6	44	88,5
ALP 1D 9	47	94,5

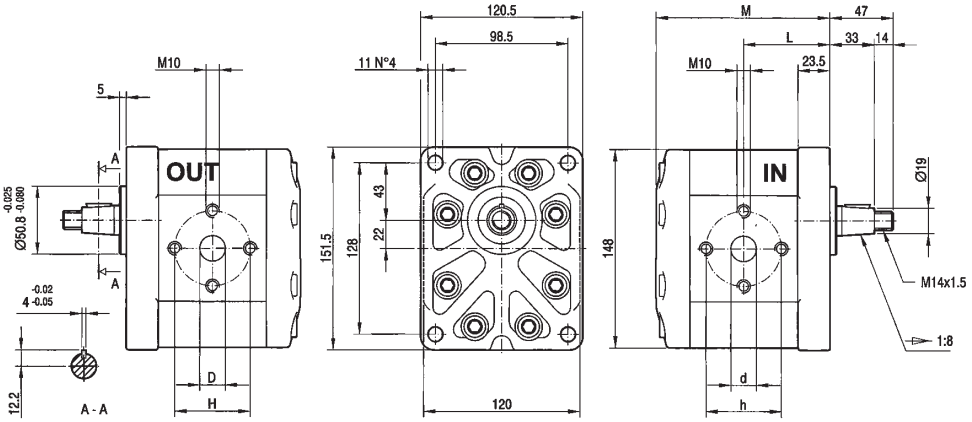
ALP 2D



Code	L	M	d	D	h	H
ALP 2D 10	47,5	97,5	13	13	M8	40
ALP 2D 13	49,5	101,5	13	13	M8	40
ALP 2D 16	51	104,5	19	13	M8	40
ALP 2D 20	53	108,5	19	13	M8	40

Code	L	M	d	D	h	H
ALP 2D 25	56	114,5	19	13	M8	40
ALP 2D 30	58,5	119,5	19	19	M8	40
ALP 2D 40	64	130,5	19	19	M8	40

ALP 3D



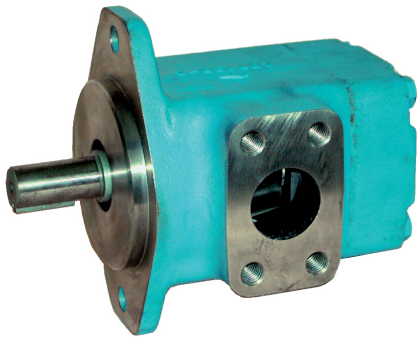
Code	L	M	d	D	h	H
ALP 3D 33	64,5	130,5	27	19	56	56
ALP 3D 40	66	133,5	27	19	56	56

Code	L	M	d	D	h	H
ALP 3D 50	68,5	138,5	27	19	56	56
ALP 3D 60	70,5	142,5	27	19	56	56

Subject to technical and dimensional changes without notice

VANE PUMPS type **V

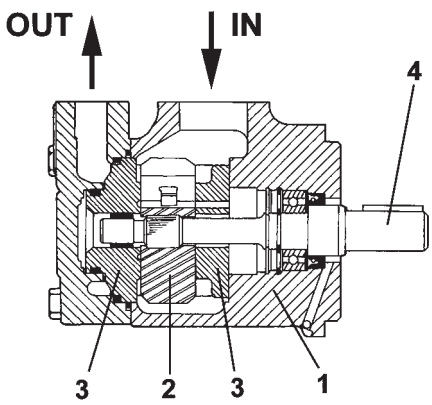
- Fixed displacement vane pumps
- Integral hydraulic balancing for high pressure operating
- Clockwise rotation (counter clockwise on request)
- Very low noise level
- Suitable for hydraulic oils according to ISO 6743/4
- Recommended oil viscosity from 20cSt to 80cSt (max permissible viscosity at the start up to 800cSt) according to class ISO 3448
- Temperature range from –20°C to +70°C
- Easy maintenance: pumping cartridge can be replaced in a few minutes
- Recommended fluid contamination level: 18/16/14 according to ISO 4406/99



PERFORMANCE DATA

ORDERING CODE	DISPLACEMENT [cm³/rev]	P_{MAX} [bar]	ABSORPTION at P_{MAX} and 1500rpm [kW]	N_{MAX} [rpm]	MASS [kg]
20V 8 A1A 22R	27	175	13	1800	12,0
20V 11 A1A 22R	36		17		14,8
25V 14 A1A 22R	45		21		
25V 17 A1A 22R	55		26		
25V 21 A1A 22R	67		32		

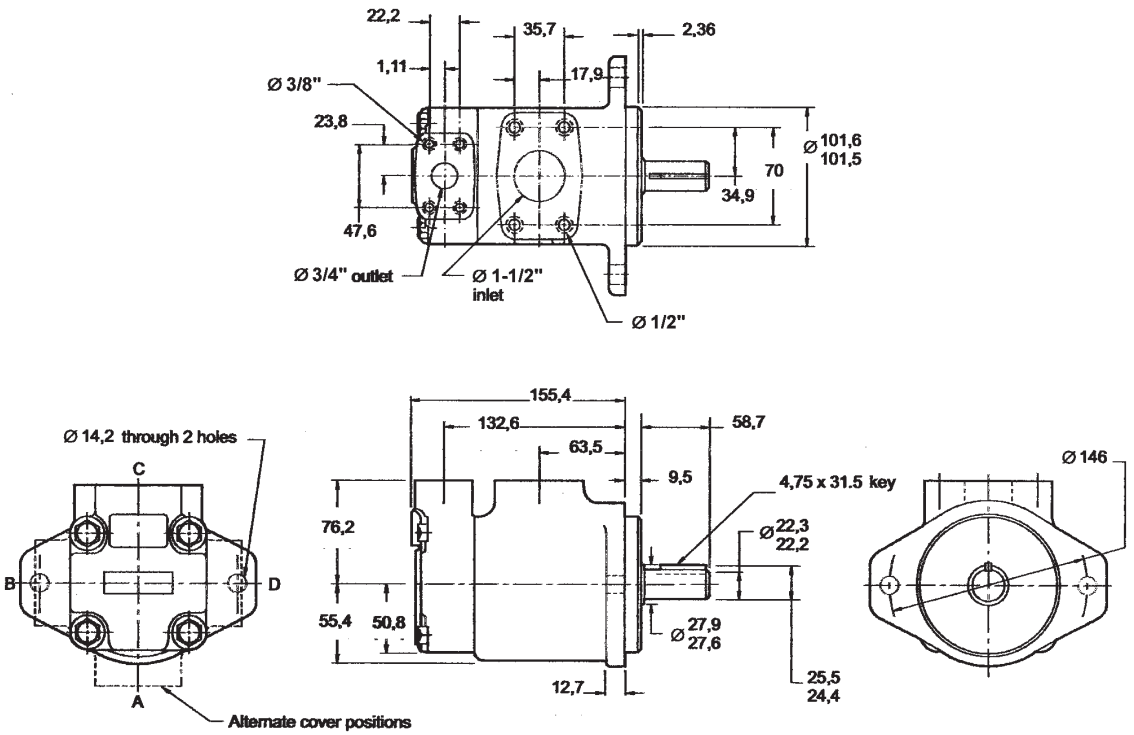
TYPICAL SECTION



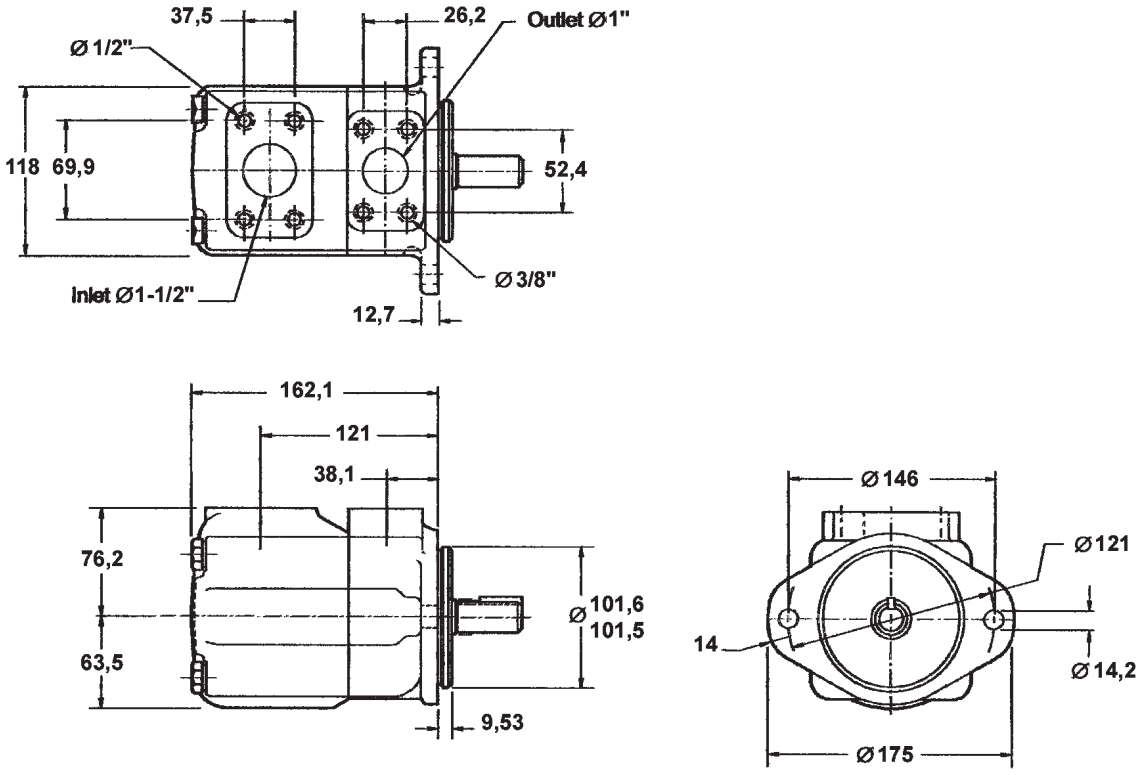
1	Body
2	Rotor with vanes
3	Balanced plates
4	Shaft

OVERALL DIMENSIONS

20V



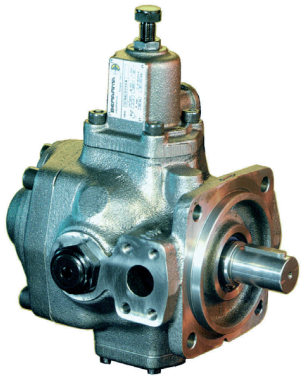
25V



Subject to technical and dimensional changes without notice

VANE PUMPS type 02 PVS

- Variable displacement vane pumps
- Pressure compensated to "zero" displacement
- Separate adjustments for pressure compensation and maximum displacement
- Clockwise rotation (counter clockwise on request)
- Very low noise level
- Suitable for hydraulic oils according to ISO 6743/4
- Recommended oil viscosity from 20cSt to 80cSt (max permissible viscosity at the start up to 400cSt) according to class ISO 3448
- Oil temperature range from –10°C to +50°C
- Recommended fluid contamination level: 18/16/14 according to ISO 4406/99



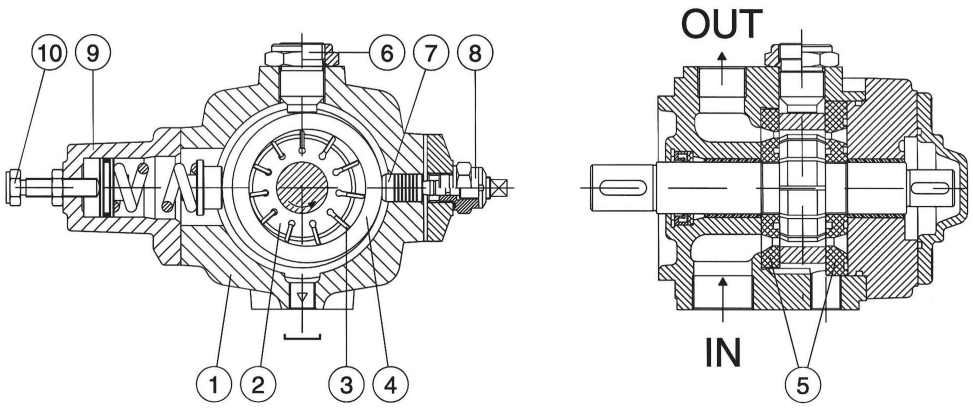
PERFORMANCE DATA

ORDERING CODE	Q_{MAX} at 1500rpm [l/min]	P_{MAX} [bar]	PRESSURE COMPENSATOR range (*) [bar]	ABSORPTION at Q_{MAX}, P_{MAX} and 1500rpm [kW]	N_{MAX} [rpm]	MASS [kg]
01 PLP 05 16 FHRM	26	120	30 to 100	5	1800	6,5
02 PVS 1 16 FHRM	26	100		5		12
02 PVS 1 20 FHRM	32			6		
02 PVS 1 25 FHRM	39			7		
02 PVS 2 31 FHRM	50			10		32

(*) Different ranges on request: "1" and "2" sizes (15 to 50 bar) - "05" size (only 20 to 120bar) - New PLP 05 size (only) is supplied with stroke limiter Q as standard. PLP 05 16 subsitutes both models PVS 05 10 and PVS 1 16

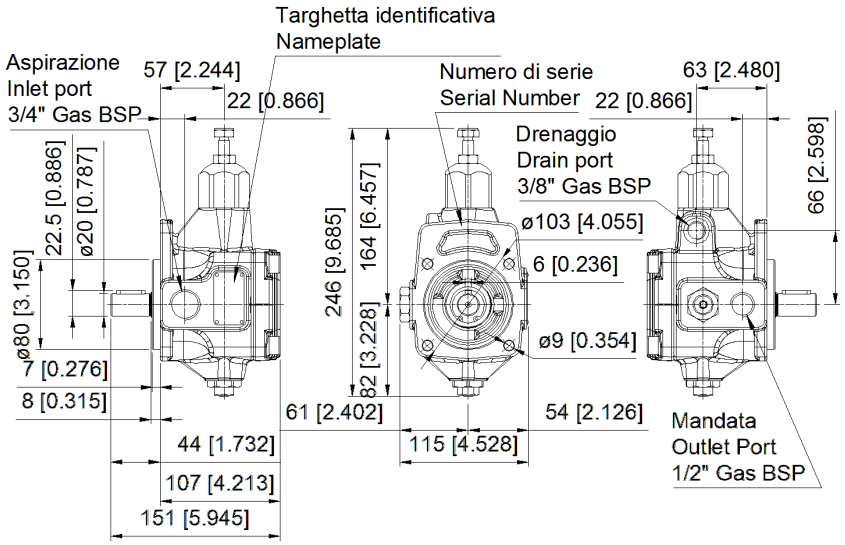
TYPICAL SECTION

1	Body	6	Balancing block
2	Rotor	7	Displacement limiter
3	Vanes	8	Adjustment screw
4	Cam ring	9	Pressure compensator
5	Balanced sealing lateral plates	10	Adjustment screw

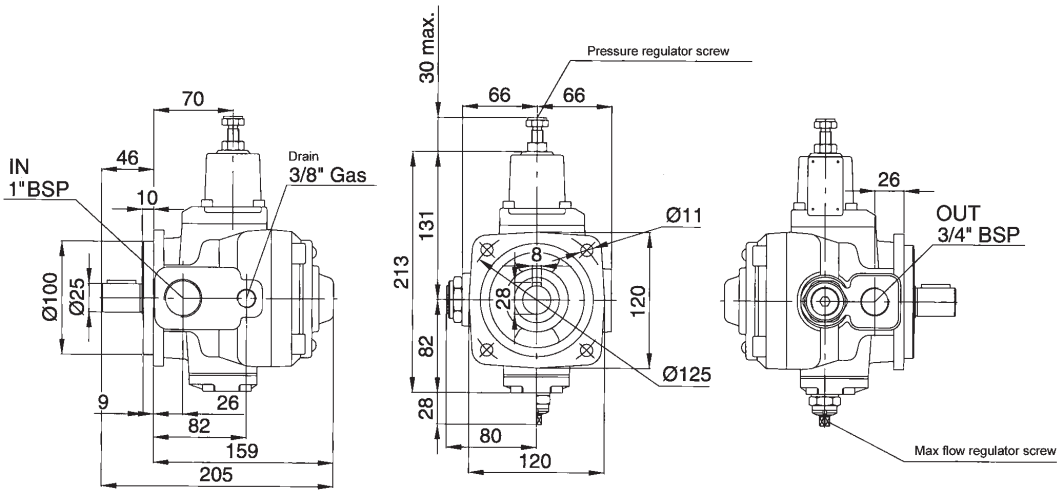


OVERALL DIMENSIONS

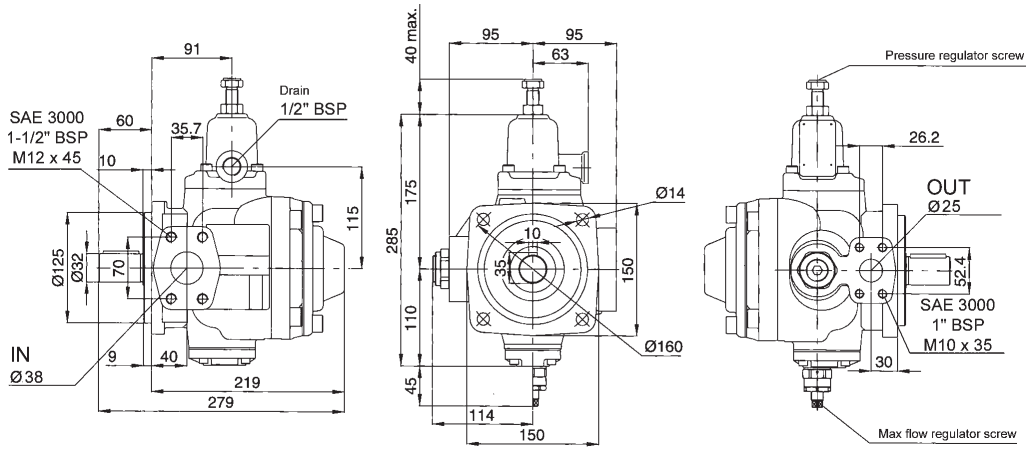
01 PLP 05



02 PVS 1



02 PVS 2



Subject to technical and dimensional changes without notice

MINI POWER PACKS

MINI POWER PACKS type SCLA Drawing 10
DC ELECTRIC MOTOR

- Mini hydraulic power packs with weight and overall dimensions really limited. Suitable for small power installations, when is required lightness, compact dimensions, easy assembly and high reliability.
- Operating pressure up to 200bar
- DC electric motor: 1,6kW or 2,2kW
- Designed for direct assembly of the new compact stackable valves AMF/HDF* (tables AD-220 to AD-270)

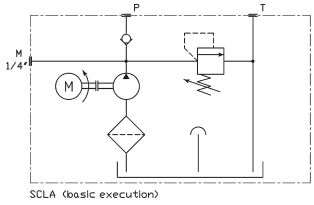
RESERVOIR	
02	2,5 L
05	5 l
08	8 l

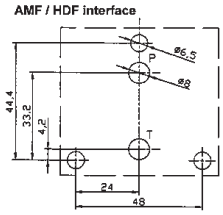
GEAR PUMP	
11	1,1 cm3/rev
16	1,6 cm3/rev
27	2,7 cm3/rev
42	4,2 cm3/rev
58	5,8 cm3/rev

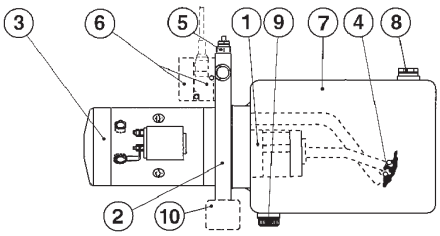
ORDERING CODE	
SCLA-02-S-11-1216 / 10	
SCLA	Series
02	Reservoir (see table)
S	Valve ports on main body: S = only on motor side D = on both sides (on request, available only with 02 reservoir)
11	Gear pump (see table)
1216	DC motor: 1216 = 12V DC – 1,6kW 2422 = 24V DC – 2,2kW
10	Drawing

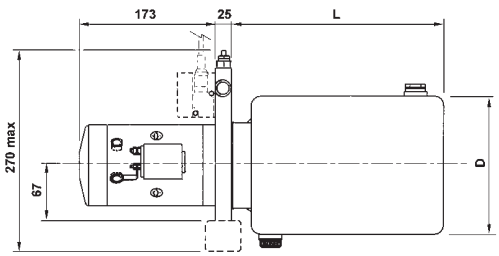
HYDRAULIC SCHEME, PARTS LIST and DIMENSIONS

1	Gear pump	6	Hand pump + starting block (options, see next page)
2	Main body	7	Reservoir
3	DC electric motor, with starter	8	Filler cap with breather (1/2")
4	Strainer (60 micron)	9	Drain plug (1/2")
5	Pressure relief valve	10	Foot mounting (on request, code PSC)







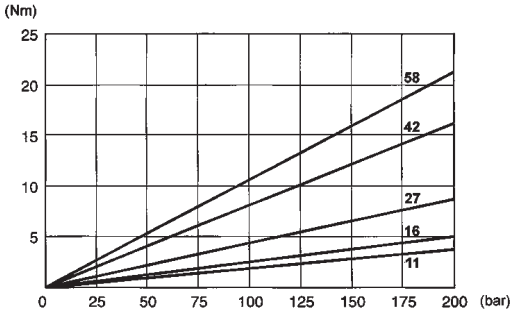


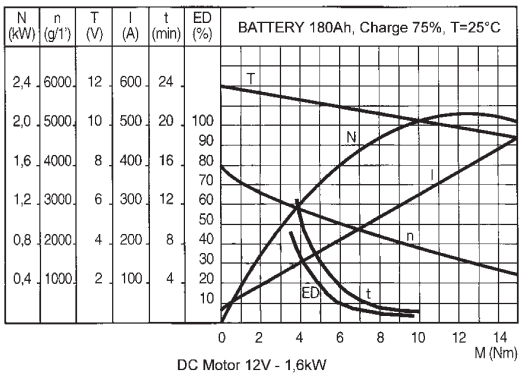
Reservoir	D	L
02	128	235
05	174	295
08	190	285

Subject to technical and dimensional changes without notice

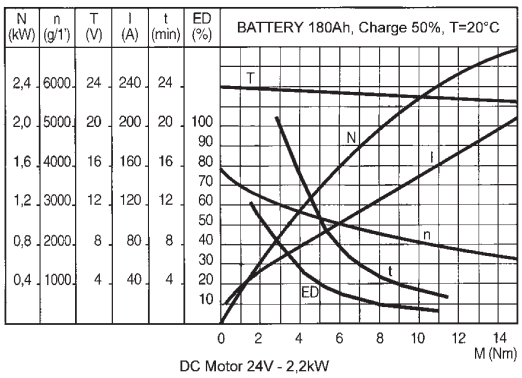
DIMENSIONING DIAGRAMS

- Find in the diagram on the right the torque (Nm) needed to pump shaft at the required pressure
- According to the required torque, for each motor type, in below report diagrams is possible to find power N (kW), rotational speed n (rpm), voltage T (V), current I (A), maximum operating full load time t (min), duty cycle ED (%).





DC Motor 12V - 1,6kW

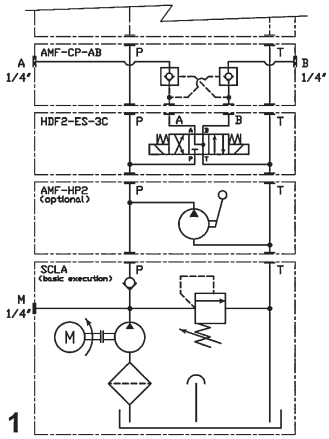


DC Motor 24V - 2,2kW

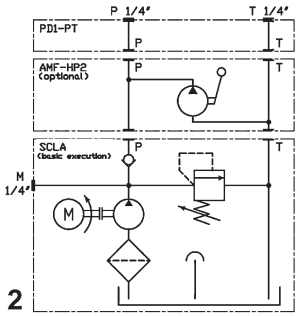
Required torque (Nm) for pump acting, depending on needed pressure (bar)

STARTING BLOCK OPTIONS

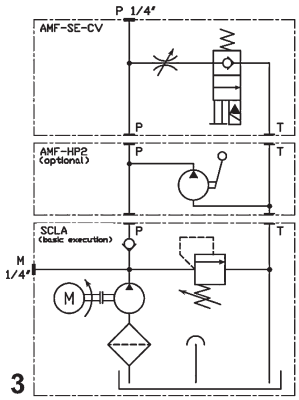
Direct assembly of HDF* electrovalves and AMF modules (see tab. AD-220 toAD-270)



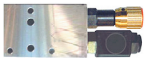
PD1-PT starting plate with P-T 1/4"BSP for general purpose hydraulic power.



AMF-SE starting plate for simple acting of cylinders (see below all the variants available)



On request, before each block or valves, can be included the stackable hand pump AMF-HP2 with 2cm^3/stroke (see table AA-400)



AMF-SE starting plates for simple acting of cylinders:

Each variant includes one solenoid operated valve type EVC.34.04 (see tab. AC-100)

Different flow regulator variants for AMF-SE modules		
AMF-SE-CV-**	1 2	Throttle adjustable
AMF-SE-Q1-**	1 2	Fixed flow 1 l/min, pressure compensated
AMF-SE-Q2-**		Fixed flow 2 l/min, pressure compensated
AMF-SE-Q4-**		Fixed flow 4 l/min, pressure compensated
AMF-SE-QV-**	1 2	Throttle adjustable, pressure compensated

** solenoid valve voltage: 12=12V DC, 24=24V DC

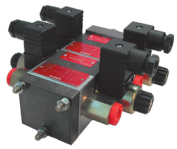
HDF(*)/AMF STACKABLE VALVES SYSTEM

Generalities

- **HDF(*) system** is designed to create very compact hydraulic control groups, by the use of stackable solenoid valves (and modules), that don't need the use of a base plate.
  All connections A and B to "users" are 1/4'' BSP and they are located directly on the solenoid valves bodies or on the pilot operated check valves.

- The HDF(*) system is optimized to control flows up to 20 l/min with max pressure of 250 bar.
- Ideal use of HDF(*) system is on standard minipowerpacks type **SCLA** (see table AS-101).

- The basic system uses **HDF-ES-**** solenoid valves, packed in a very compact overall dimensions, where the 4-way solenoid valve share common P and T lines (in parallel or in series connection) and A and B ports are located on the top of each 4-way valve.
- The more sophisticated systems uses **HDF2-ES-**** solenoid valves, where connections to A and B lines are internal and therefore it is possible to stack modules that control flow or pressure on individual A and/or B ports : typically the use of p.o. check valve is current.



- Elements from HDF and HDF2 systems can be mixed and can be stacked together, then giving an optimum of flexibility
- Installation normally is made by fastening, by 3 tie rods, the stack of HDF(*) valves on a plate or manifold or block where a surface presents suitably located P and T connections.
  This principle permits the best installation of HDF(*) stacks on minipowerpacks SCLA, on control blocks or, as a piggy back, on banks of larger 4-way control valves.
- In current application of HDF system, a "closing" plate is needed to seal the P and T lines that are passing through the stack of valves.
  In case of repetitive or large scale application, the use of "blind" final elements could be of great help:
  - solenoid valves type **HDFC-ES-**** (P and T ports on face with seals)
  - solenoid valves type **HDFB-ES-**** (P and T ports on face without seals)
  - p.o. check valves type **AMFC-CP-AB**

  These eliminate the need of a "closing" plate and permit shorter tie rods

Components for the HDF system

4-way solenoid valves (see table AD-220)

- Valves type **HDF-ES-****, see table AD-220. Those are the basic elements with A and B ports (1/4" BSP) on top of valve; P and T passing through.

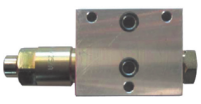
F2-ES-**, see table AD-230. Those valves have P and T passing through and internal connection for A and B line. Normally the A and B 1/4" BSP ports must be plugged and a suitable control module is associated to the valve.
- In the basic versions the spool can be manually shifted by acting on the emergency pins. This manual override can be replaced by lockable override nut device type **G01-E**

Control modules

- Pilot operated check valve type **AMF-CP-AB** (see table AD-250)
  Associated to HDF2-ES-*** solenoid valve, operates on A and B lines and presents A and B ports connections 1/4" BSP on sides.

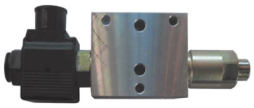
Relief valves

- **AMF-MOP/*-CC** ; (see table AM-F60)



Relief valve acting on main (common) P line (passing) with discharge on (common) T line (passing) **AMF-MOP/*-P1; AMF-MOP/*-T1**. Options: Version P1 presents an auxiliary 1/4" BSP port P on one side. In the same way Version T1 presents an auxiliary 1/4" BSP port T on one side.

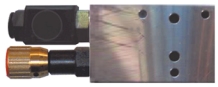
- Relief combined with variable flow control valve type **AMF-MOP/*-CF**
  This valve presents, in parallel with the relief valve, a regulated bleeding flow from P line to T line. Version with graduated knob for the throttle valve is available (**AMF-MOP/*-CV**).
- Relief combined with pressure compensated flow control valve type **AMF-MOP/*-Q*** (see table AM-F60)
  This valve presents, in parallel with the relief valve, a pressure compensated bleeding flow from P line to T line. Bleeding flow rate can be fixed (AMF-MOP/*-Q(*)) or adjustable (**AMF-MOP/*-QV**).



- Relief combined with electric by-pass valve type **AMF-MOP/*-EV2*** (see table AD-270)
  This valve presents, in parallel with a pressure relief valve, a directional valve that allows connection of P and T lines with electric command. Normally open (AMF-MOP/*-EV2O) and normally closed (AMF-MOP/*-EV2C) versions are available.

- A and B pressure relief valve type **AMF-MO-BA** (see table AD-265).
  Relief valve acting on A and B line with discharge on (common) T line. P line is passing.

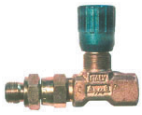
Plates



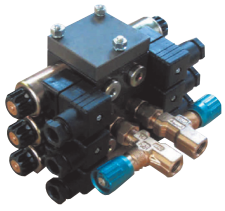
- Inlet/outlet modules type **AMF-SE-*** (see table AS-101).
  This is a plate with standard HDF-ES interface (inlet) on one face and additional P and T ports (1/4" BSP) on one side. This plate is equipped with a NC 2/2 solenoid valve that discharge P line on T line (AMF-SE-CO);. This function is typical for simple acting cylinders.
  In series with the NC 2/2 solenoid valve is possible to use a flow control valve that can be : throttle adjustable (**AMF-SE-CV**); fixed flow, pressure compensated (**AMF-SE-Q(*)**); adjustable flow pressure compensated (**AMF-SE-QV**)
- Inlet/outlet module type **PD1-PT** (see table AS-101).
  This plate presents HDF-ES interface (inlet) on one face and P and T ports (1/4" BSP) on one side.
- Inlet/outlet module type **PD1-03/32-5** (see table AD-220).
  This plate presents HDF-ES interface (outlet) on one face and P and T ports (1/4" BSP) on the other face.
- Intermediate plate type **AMF-PM-TP**. This module permits change of circuit from "parallel" to "series" (T1→P2).

- Steel closing plate type **PD1-03/32-0** (see table AD-220).
- Closing plate is not necessary when HDFC-ES-*** or AMFC-ES-*** are used.

In line valves and accessories



- In line throttle and check valve type **HFC-14** (see table AF-114).

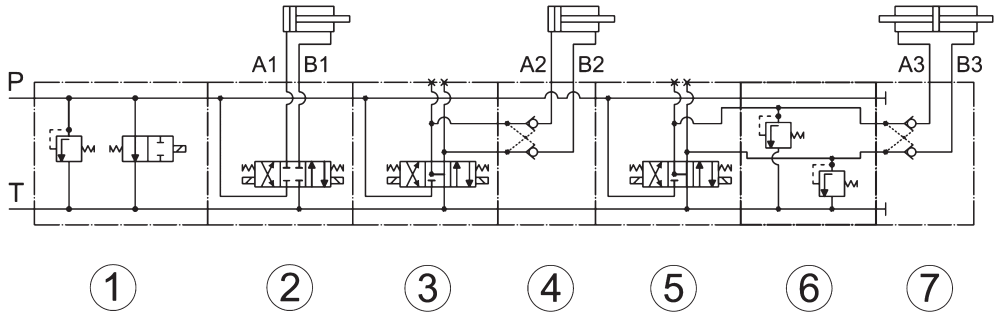


This valve can be screwed directly on the A and B exit ports of the HDF-ES-*** valves, obtaining free direct flow and restricted reverse flow (adjustable).
The presence of a "turning connector" allows the contemporary mounting of two valves on both ports of the solenoid valve.
- If a fixed throttle on P or T lines is needed is possible to use the "section reducers" type 3S-**, that can be installed on the interested port under the seal.

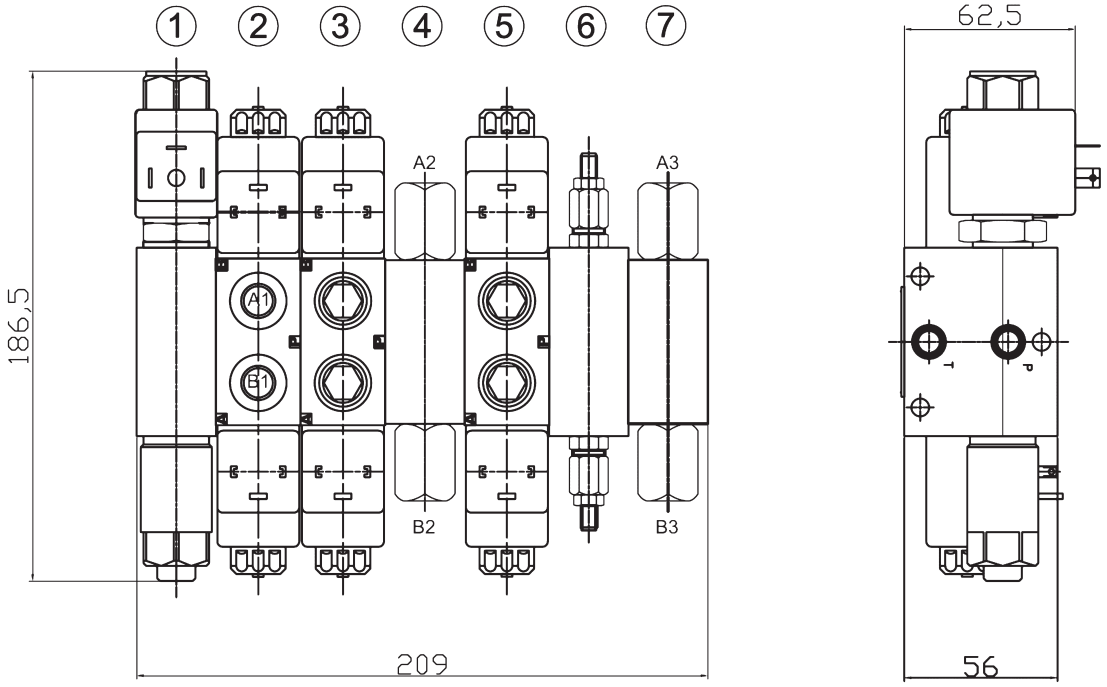
- A standard mounting kit angulare **MAF-KIT-2**, in case of HDF*/AMF standing alone block (not connected to power pack SCLA), helps to connect the valves block by screws to the chassis of machine or to the tank of power unit.

CIRCUIT EXAMPLES

- The use of HDF system permits to obtain hydraulic circuits in very low dimensions. The following scheme can be taken as an example :



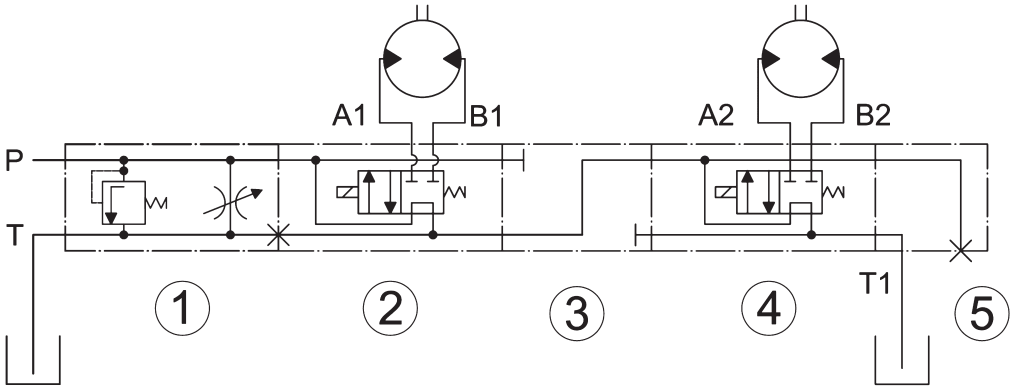
- With HDF(*) stackable system is possible to realize this circuit using seven elements :

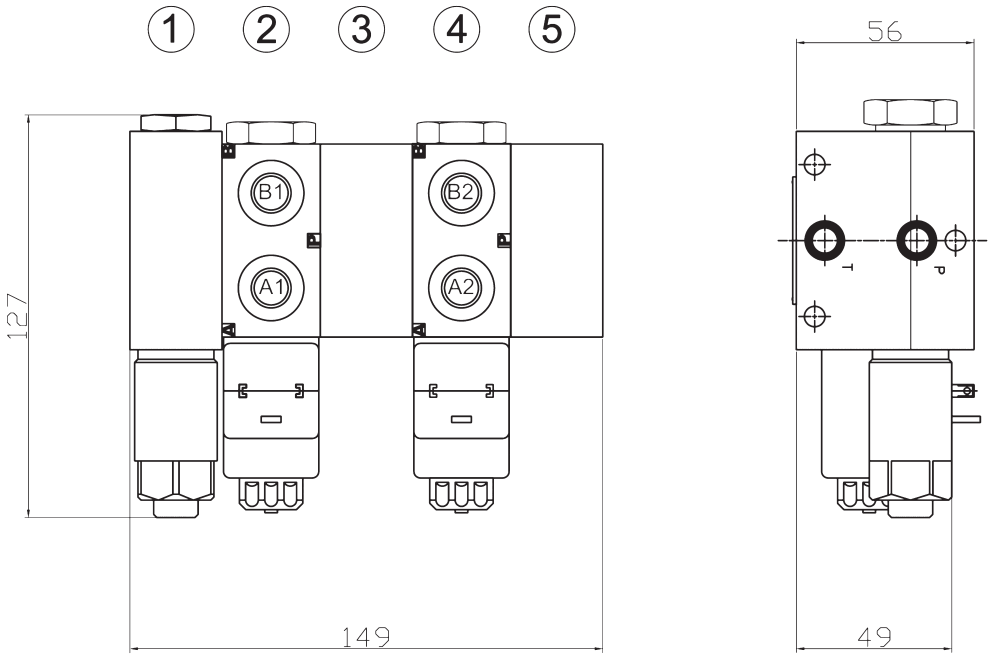


1	By-pass valve in parallel with a relief valve (AMF-MOP/*-EV20)	5	4-way solenoid operated valve with internal A and B ports (HDF2-ES-3C-****)
2	4-way solenoid operated valve (HDF-ES-1C-****)	6	Relief valve operating on A and B lines separately (AMF-MO-BA)
3	4-way solenoid operated valve with internal A and B ports (HDF2-ES-3C-****)	7	Double p.o. check valve, blind version(AMFC-CP-AB)
4	Double p.o. check valve (AMF-CP-AB)		

TANDEM CIRCUIT EXAMPLE

- The use of AMF-PM-TP module permits to realize, shifting the flow from P to T line, a tandem circuit in very simple way. This leads to a small size of the block. This solution implies the need for an additional T port, which is available, for example, in the closing element PD1-PT.
  An example of a circuit with series connection of two hydraulic motors is shown in the following figures :

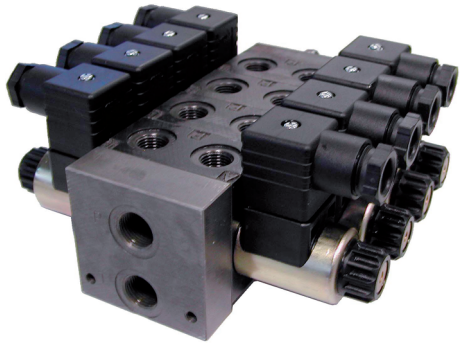




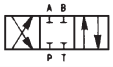
1	Pressure relief valve in parallel with a variable bleeding flow (AMF-MOP/*-CF)
2	4- way solenoid operated valve (HDF-ES-4ML-****)
3	Intermediate plate for tandem circuit (AMF-PM-TP)
4	4-way solenoid operated valve (HDF-ES-4ML-****)
5	Closing plate with additional G1/4 P(plugged) and T port (PD1-PT)

HYDRAULIC STACKABLE VALVES type HDF-ES
DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- **Standard stackable feature up to 8 bodies**
- 31 mm body thickness for a really compact assembly
- Oil immersed solenoids for AC and DC current
- 100% duty cycle
- Manual override
- Maximum operating pressure (port P-A-B): 250 bar
- Maximum operating pressure (port T): 210 bar
- Maximum flow rate: 20 l/min
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.



SPOOL TYPE **

0	
1	
3	
4	

DRIVE ARRANGEMENT

C	
N	
LL	
ML	

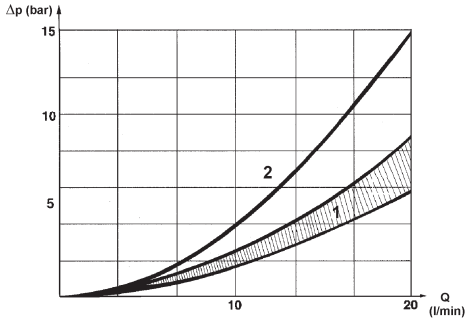
ORDERING CODE

HDF – ES – 1 C – * – 024C/10

HDF	4-way directional control valve
ES	Electrically controlled
1	Spool type (see table)
C	Drive arrangement (see table)
*	b: only for versions LL, ML, LM solenoid “b”
024C	= Coil voltage = (admissible variation: ±10%) 0000: No coils 012C: 12V DC – 2,8A 024C: 24V DC – 1,4A 110R: rectified 115V AC – 50/60Hz 0,35A 220R: rectified 230V AC – 50/60Hz 0,17A
10	Drawing number
PD1-03/32-5	Inlet closing plate (steel)
PD1-03/32-0	End closing plate (steel)
MAF-KIT-2	Mounting angle kits

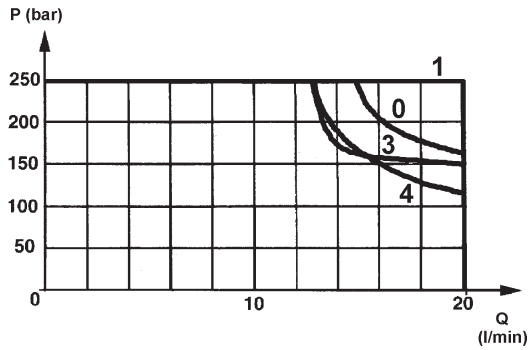
TYPICAL DIAGRAMS

Typical **Δp-Q** curves for valves **HDF-ES** in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T



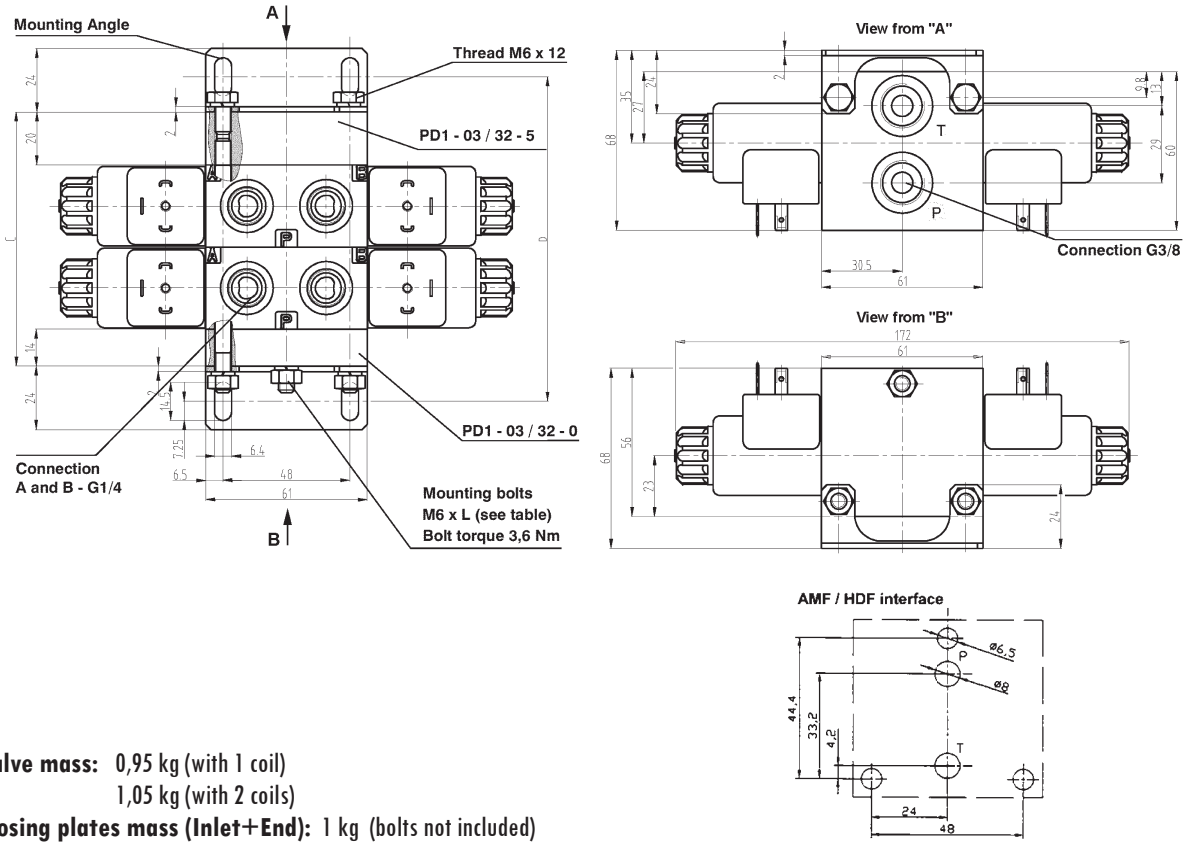
1) All spools P→A,B and A,B→T. Spool 4 P→T. **2)** Spool 4 P→A,B

Typical **p-Q** curves of operating limits for maximum hydraulic power transferred by valves **HDF-ES**



0) Spool type 0 **1)** Spool type 1 **3)** Spool type 3 **4)** Spool type 4

BLOCK ASSEMBLY



Valve mass: 0,95 kg (with 1 coil)
1,05 kg (with 2 coils)
Closing plates mass (Inlet+End): 1 kg (bolts not included)

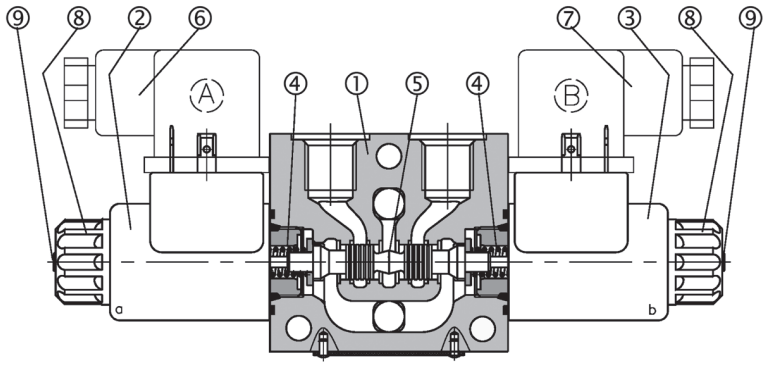
DIMENSIONS

Number of sections	1	2	3	4	5	6	7	8
Dimension C [mm]	65	96	127	158	189	220	251	282
Dimension D [mm]	91,5	122,5	153,5	184,5	215,5	264,5	277,5	308,5
Bolts length L [mm]	55	100	133	163	194	224	256	287

Subject to technical and dimensional changes without notice

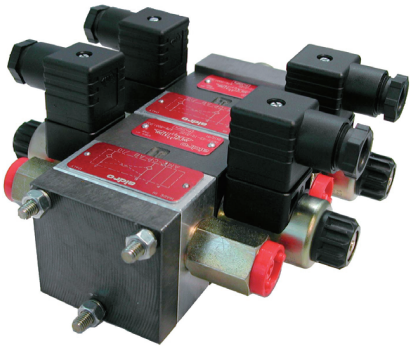
TYPICAL SECTION

1	Body	6-7	Electrical connector
2-3	Solenoid	8	Retaining nut
4	Spring	9	Emergency pin
5	Spool		

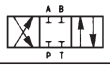
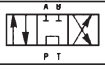


HYDRAULIC STACKABLE VALVES type HDF2-ES
DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- 31 mm body thickness for a really compact assembly
- Special execution **designed for assembly with double check valve AMF-CP-AB** (29 mm thick – Tab. AD-250)
- A, B ports on side position
- Oil immersed solenoids for AC and DC current
- 100% duty cycle
- Manual override
- Maximum operating pressure (port P-A-B): 250 bar
- Maximum operating pressure (port T): 210 bar
- Maximum flow rate: 20 l/min
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.



SPOOL TYPE **

0	
1	
3	
4	

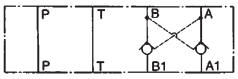
DRIVE ARRANGEMENT

C	
N	
LL	
ML	

ORDERING CODE

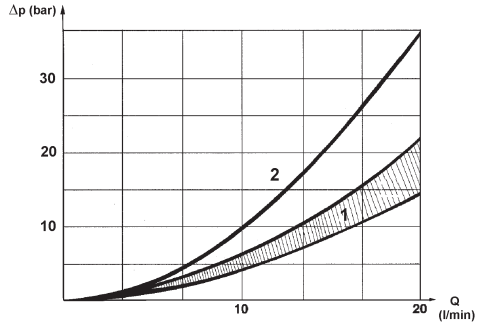
HDF2 – ES – 3 C – * – 012C/10

HDF2	4-way directional control valve
ES	Electrically controlled
3	Spool type **(see table)**
C	Drive arrangement **(see table)**
*	b: only for versions LL, ML, LM solenoid "b"
012C	= Coil voltage = (admissible variation: ±10%) 0000: No coils 012C: 12V DC – 2,8A 024C: 24V DC – 1,4A 110R: rectified 115V AC – 50/60Hz 0,35A 220R: rectified 230V AC – 50/60Hz 0,17A
10	Drawing number
PD1-03/32-5	Inlet closing plate (steel)
PD1-03/32-0	End closing plate (steel)
MAF-KIT-2	Mounting angle kits

AMF-CP-AB		Double check valve (A,B) pilot operated

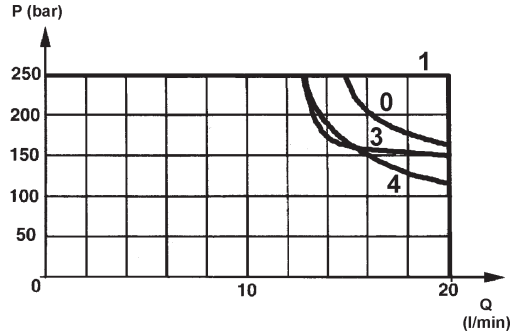
TYPICAL DIAGRAMS

Typical **Δp-Q** curves for valves **HDF2-ES + AMF-CP-AB**, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T



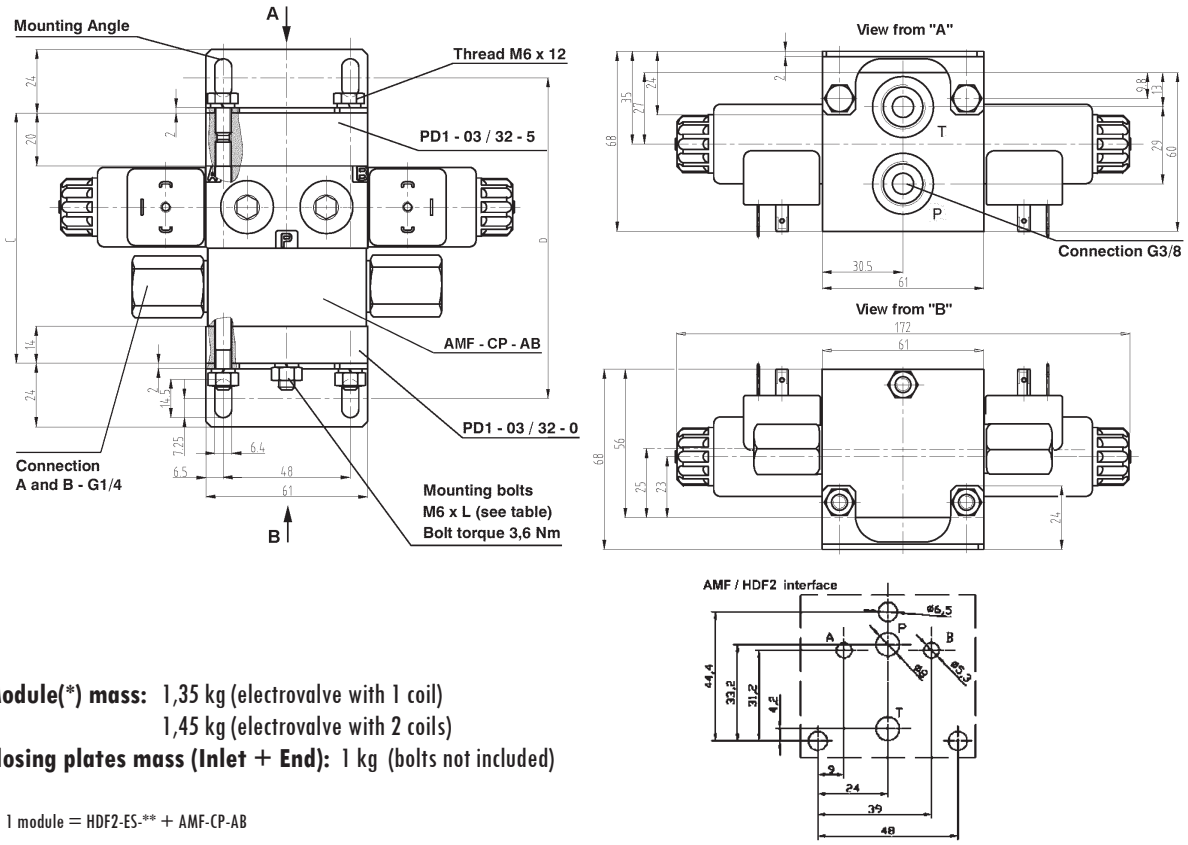
1) All spools P→A,B and A,B→T. Spool 4 P→T. **2)** Spool 4 P→A,B

Typical **p-Q** curves of operating limits for maximum hydraulic power transferred by valves **HDF2-ES**



0) Spool type 0 **1)** Spool type 1 **3)** Spool type 3 **4)** Spool type 4

BLOCK ASSEMBLY



Module(*) mass: 1,35 kg (electrovalve with 1 coil)
1,45 kg (electrovalve with 2 coils)
Closing plates mass (Inlet + End): 1 kg (bolts not included)

(*) 1 module = HDF2-ES-** + AMF-CP-AB

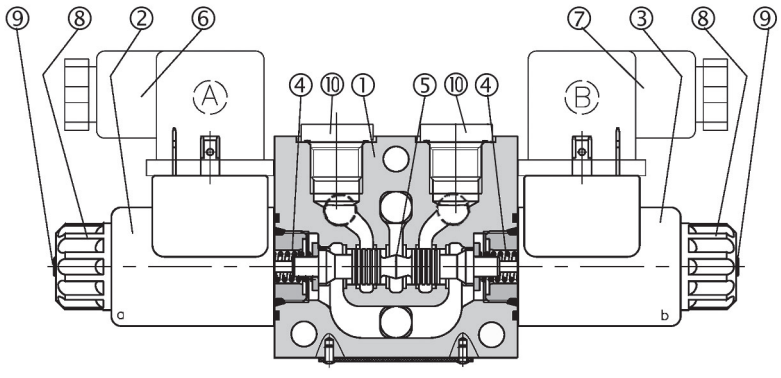
DIMENSIONS

Number of sections	1	2	3	4	5	6
Dimension C [mm]	94	154	214	274	334	394
Dimension D [mm]	120,5	180,5	240,5	300,5	360,5	420,5
Bolts length L [mm]	100	163	224	287	340	400

Subject to technical and dimensional changes without notice

TYPICAL SECTION

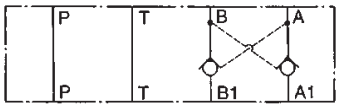
1	Body	6-7	Electrical connector
2-3	Solenoid	8	Retaining nut
4	Spring	9	Emergency pin
5	Spool	10	Plug



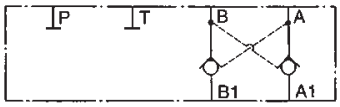
HYDRAULIC COMPACT STACKABLE CHECK VALVES type AMF-CP PILOT OPERATED

- Hydraulic check valves pilot operated
- **AMF / HDF2** interface, stackable assembly
- Pilot ratio 1: 2,2
- Max operating pressure: 250 bar
- Max recommended flow: 20 l/min
- Mass: 0,40 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt

SYMBOL



1



2

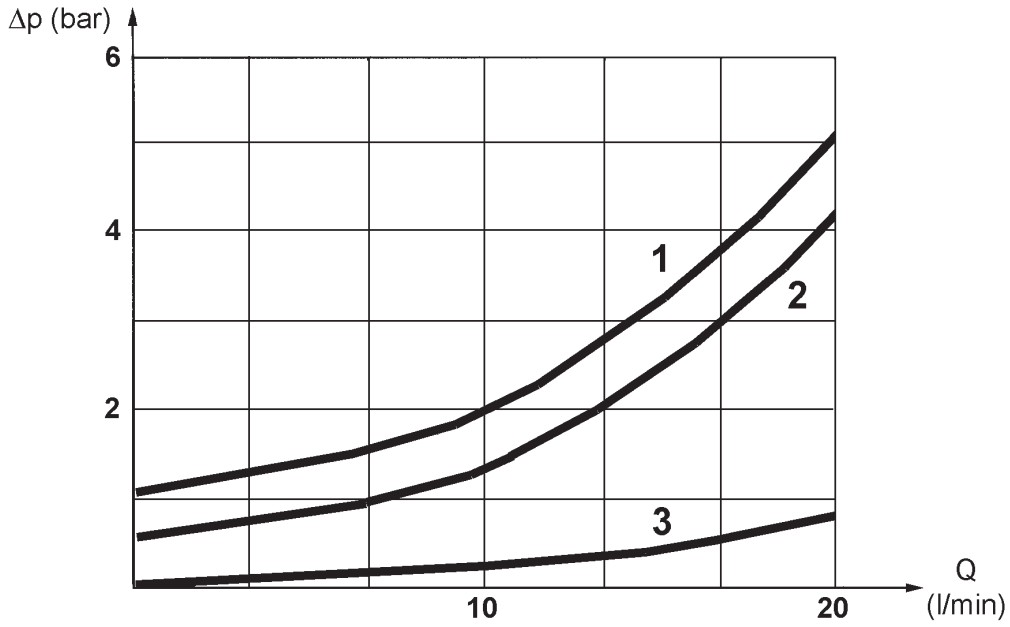
ORDERING CODE

AMF(C) – CP – AB

AMF	AMF compact stackable valve - P,T free **(see symbol 1)**
(C)	End of stackable module - P, T plugged **(see symbol 2)**
CP	Pilot operated check valve
AB	Dual check valve on A and B

TYPICAL DIAGRAM

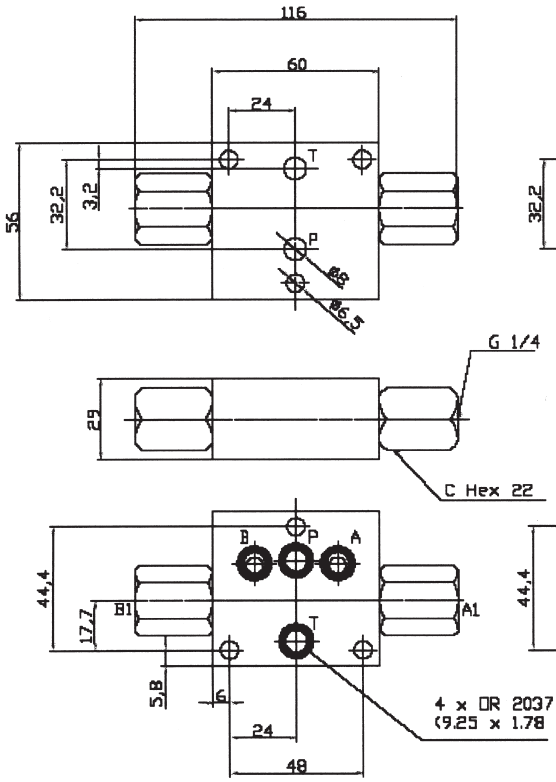
Typical **Δp-Q** curves for valves **AMF-CP,** with mineral oil at 36cSt and 50°C for flow A1↔ A, B1↔ B and free channels



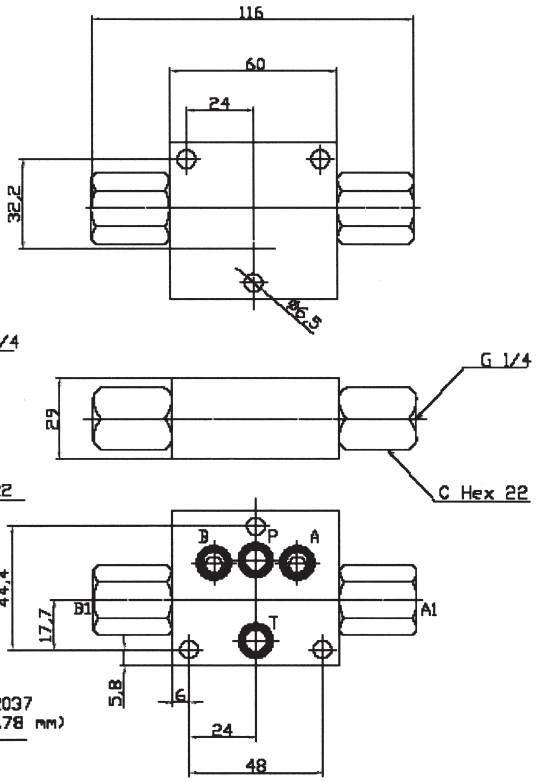
1) A→ A1 and B→B1 **2)** A1→A and B1→B **3)** Free channels

OVERALL DIMENSIONS

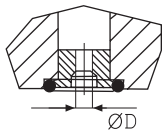
AMF-CP-AB



AMFC-CP-AB

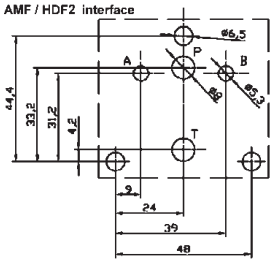


Available for P and T lines 'section reducer' with O ring



D (mm)	CODE
1,0	35-10
1,5	35-15
2,0	35-20
2,5	35-25

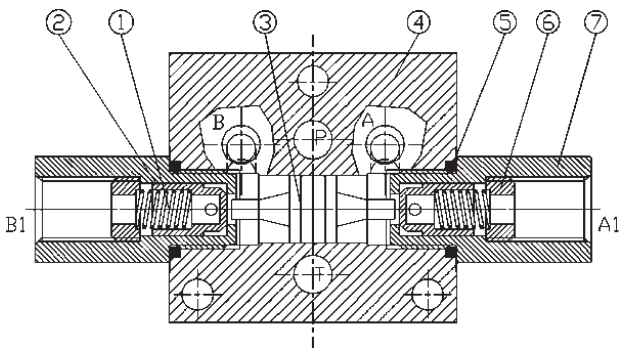
AMF / HDF2 interface



Subject to technical and dimensional changes without notice

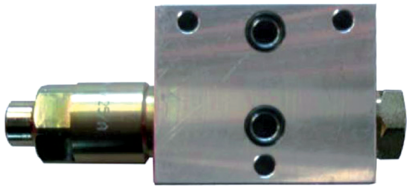
TYPICAL SECTION

1	Spring	5	Seal
2	Poppet	6	Check device holder
3	Pilot piston	7	Check valve body
4	Main body		

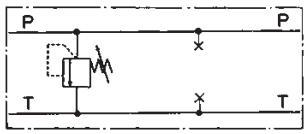


HYDRAULIC COMPACT STACKABLE VALVES type AMF-MOP
PRESSURE RELIEF – DIRECT ACTING

- Hydraulic pressure relief valves, direct acting
- **AMF / HDF** interface, stackable assembly
- Adjustment by nut
- Max operating pressure : 250 bar
- Max recommended flow: 20 l/min
- Mass: 0,30 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt



SYMBOL



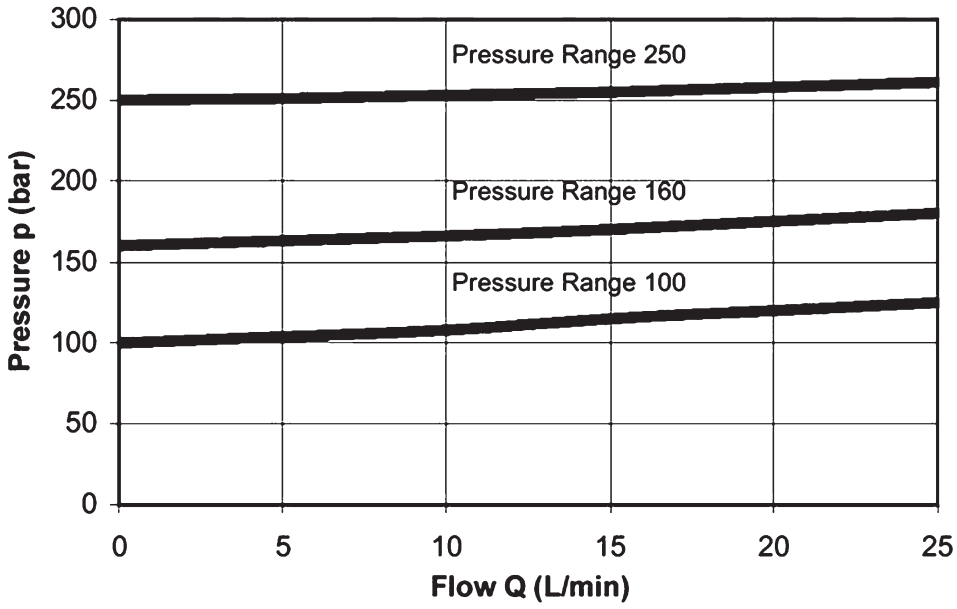
ORDERING CODE

AMF – MOP / 10

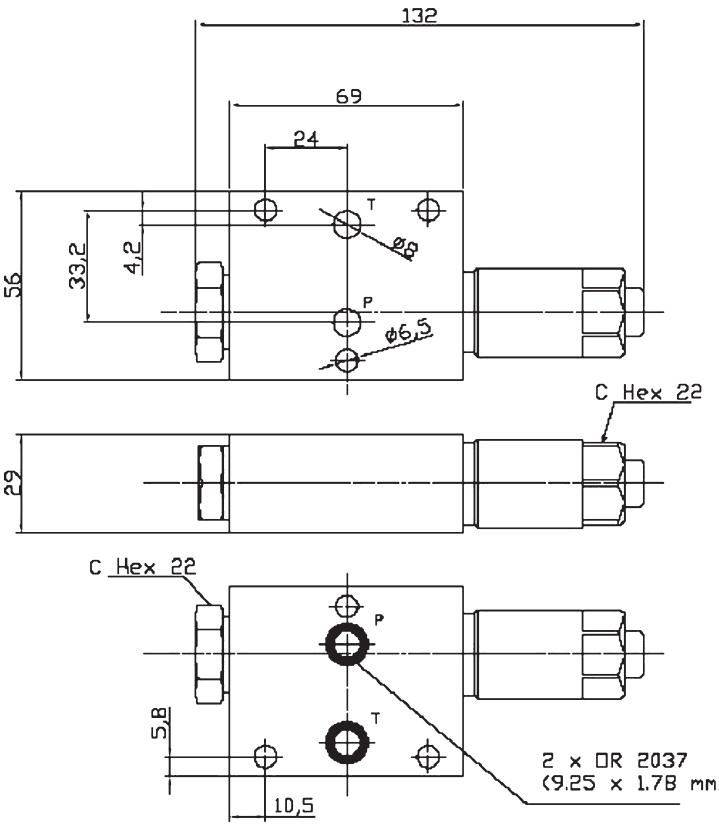
AMF	AMF compact stackable valve
MOP	Pressure relief on P line, direct acting
10	Setting ranges: **10:** 32 to 100 bar **16:** 63 to 160 bar **25:** 100 to 250 bar

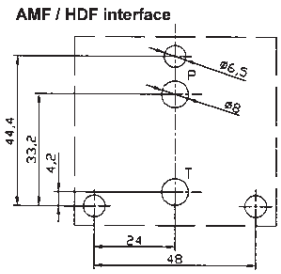
TYPICAL DIAGRAM

Typical **Δp-Q** curve diagram for pressure relief valve **AMF-MOP** with mineral oil at 36cSt and 50°C

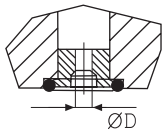


OVERALL DIMENSIONS





Available for P and T lines section reducer with O ring

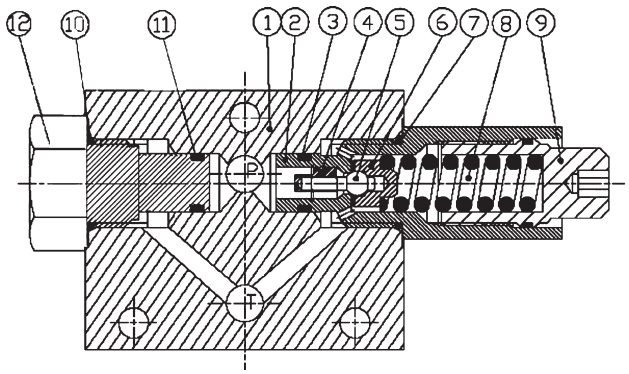


D (mm)	CODE
1,0	35-10
1,5	35-15
2,0	35-20
2,5	35-25

Subject to technical and dimensional changes without notice

TYPICAL SECTION

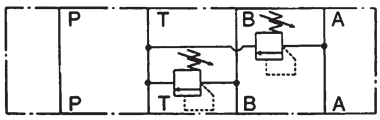
1	Main body	7	Seal
2	Pressure relief valve body	8	Spring
3	Seal	9	Adjustment nut
4	Piston guide	10	Seal
5	Piston	11	Seal
6	Piston holder	12	Plug



HYDRAULIC COMPACT STACKABLE VALVES type AMF-MO-AB
PRESSURE RELIEF – DIRECT ACTING

- Hydraulic pressure relief valves, direct acting
- **AMF / HDF** interface, stackable assembly
- Adjustment by screw with locking nut
- Max operating pressure: 250 bar
- Max flow rate: 20 l/min service lines (P, T)
  6 l/min bleeding lines (A, B)
- Mass: 0,30 kg
- Standard pressure range up to 250 bar
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL



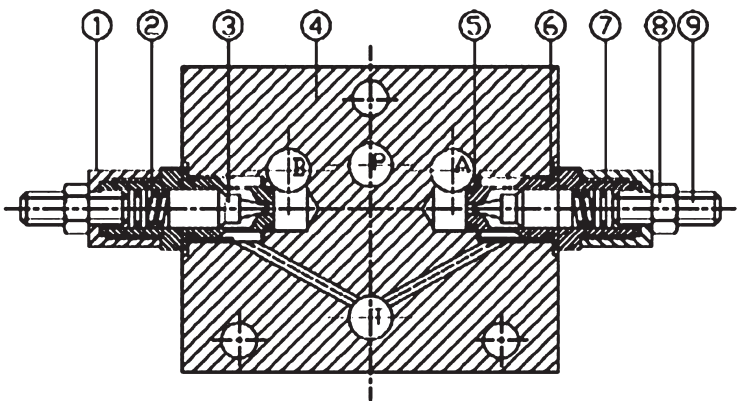
ORDERING CODE

AMF – MO – AB

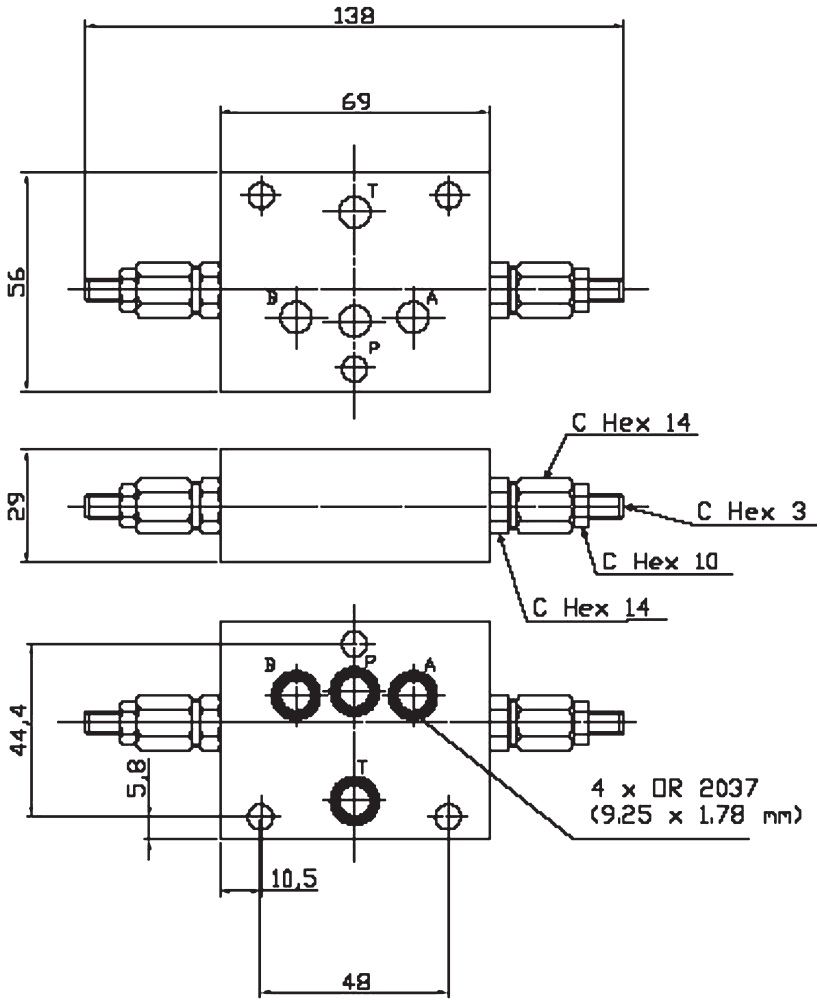
AMF	AMF compact stackable module
MO	Pressure relief, direct acting
AB	Control on A and B lines

TYPICAL SECTION

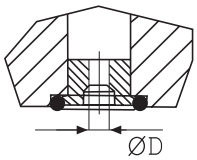
1	Valve holder	6	Seal
2	Spring	7	Relief valve body
3	Poppet	8	Locking nut
4	Main body	9	Adjustment screw
5	Seal		



OVERALL DIMENSIONS

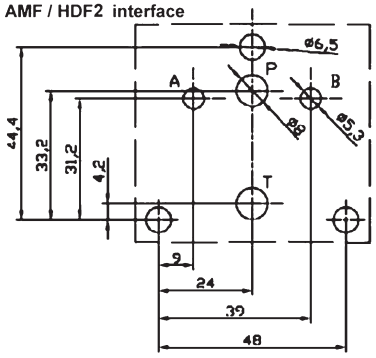


Available, for P, T, A and B lines,
a restrictor with O ring



D (mm)	CODE
1,0	35-10
1,5	35-15
2,0	35-20
2,5	35-25

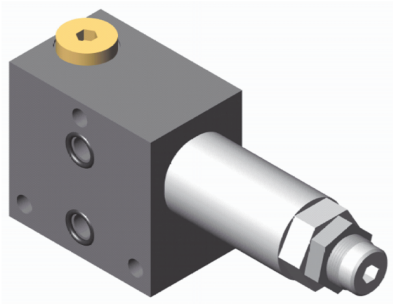
AMF / HDF2 interface



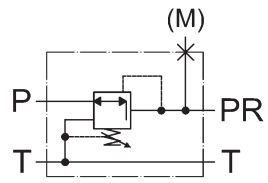
Subject to technical and dimensional changes without notice

HYDRAULIC COMPACT STACKABLE VALVES type AMF-RO
PRESSURE REDUCING - DIRECT ACTING

- Hydraulic pressure reducing valves, direct acting.
- **AMF / HDF** interface, stackable assembly
- Adjustment by screw with locking unt
- Max nominal pressure: 250 bar
- Max reduced pressure: 210 bar
- Max recommended flow: 20 l/min
- Mass: 0,50 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt



SYMBOL



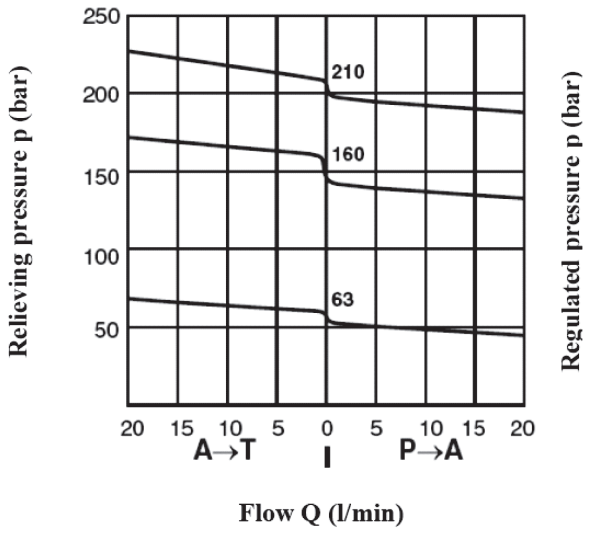
ORDERING CODE

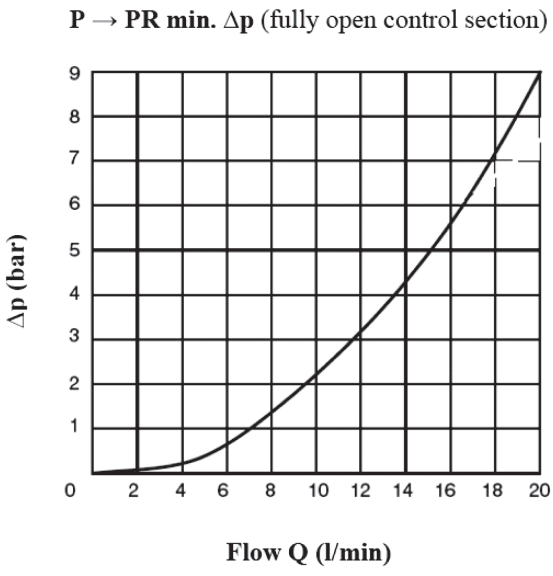
AMF – RO – P/6,3

AMF	AMF compact stackable valve
RO	Direct operating pressure reducing
P	Control on P, 3rd way on T line
6,3	Setting range: **6,3** = 16 to 63 bar **16** = 40 to 160 bar **20** = 50 to 210 bar

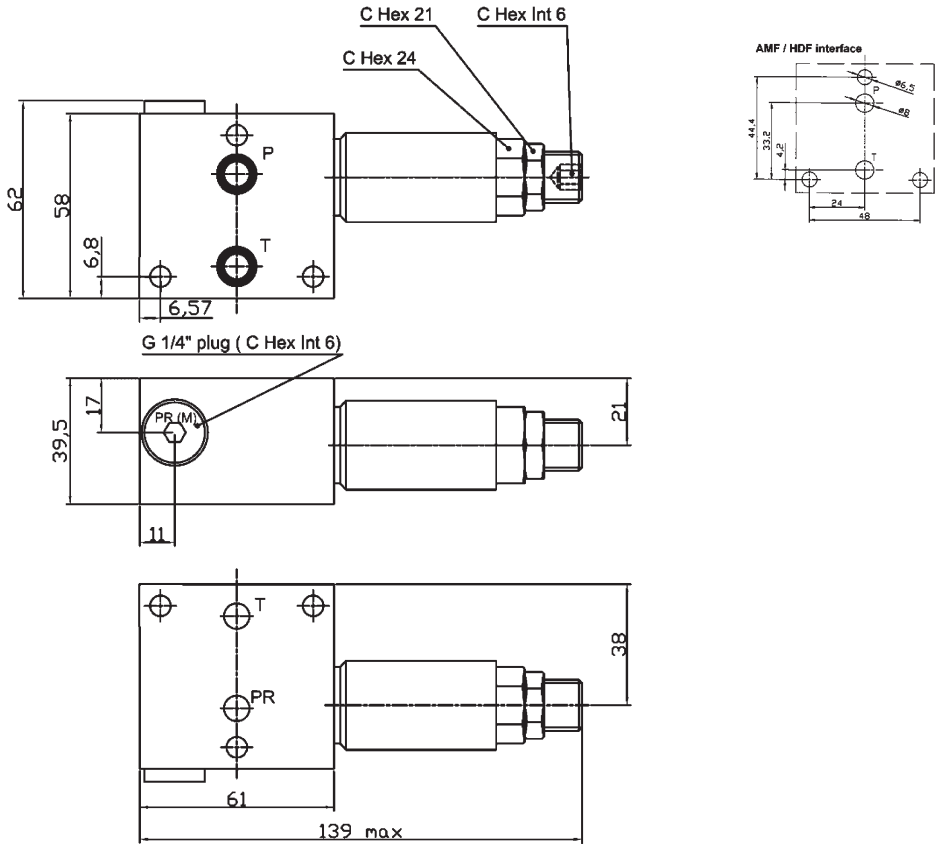
TYPICAL DIAGRAM

Typical **Δp-Q** regulation curves and **Δp-Q** pressure drops for valves AMF-RO with mineral oil at 36cSt and 50°C





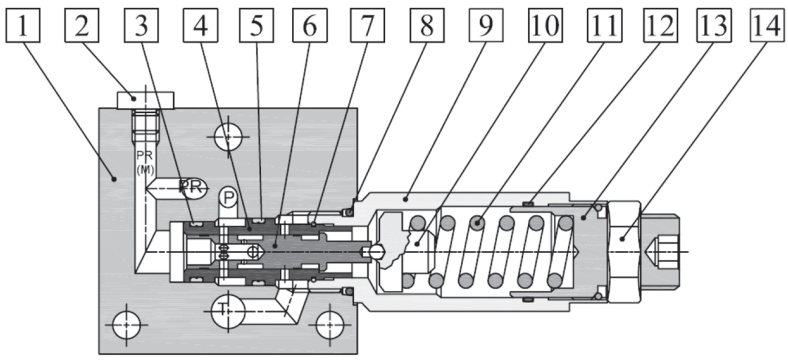
OVERALL DIMENSIONS



Subject to technical and dimensional changes without notice

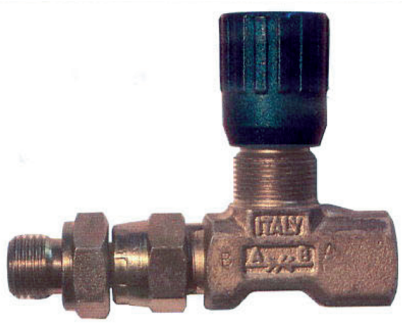
TYPICAL SECTION

1	Main body	8	Seal
2	plug (M port 1/4" BSP)	9	Reducing valve holder
3	Seal	10	Spring holder
4	Reducing valve body	11	Spring
5	Seal	12	Spring holder seal
6	Throttling spool	13	Seal
7	Seal	14	Setting screw

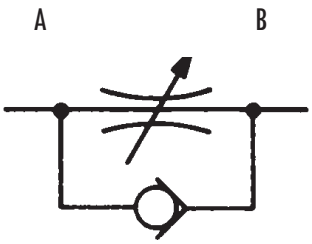


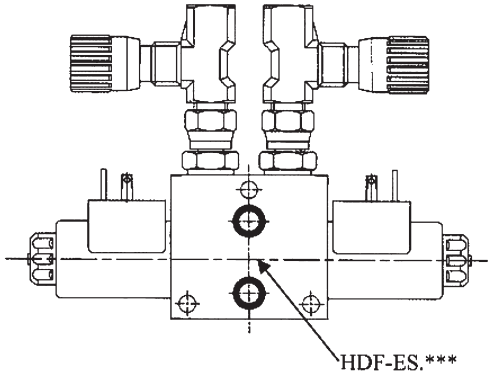
INLINE THROTTLE VALVE type HFC-14
1-WAY - ADJUSTABLE

- Flow control valves, needle type
- **1-way flow control**, adjustable
- BSP thread ports for in-line assembly
- **Steel** body, poppet and spring in steel
- Maximum operating pressure: **400 bar**
- Adjustment hand-grip with locking screw
- Special version with rotational joint for easy assembly on **HDF** valves

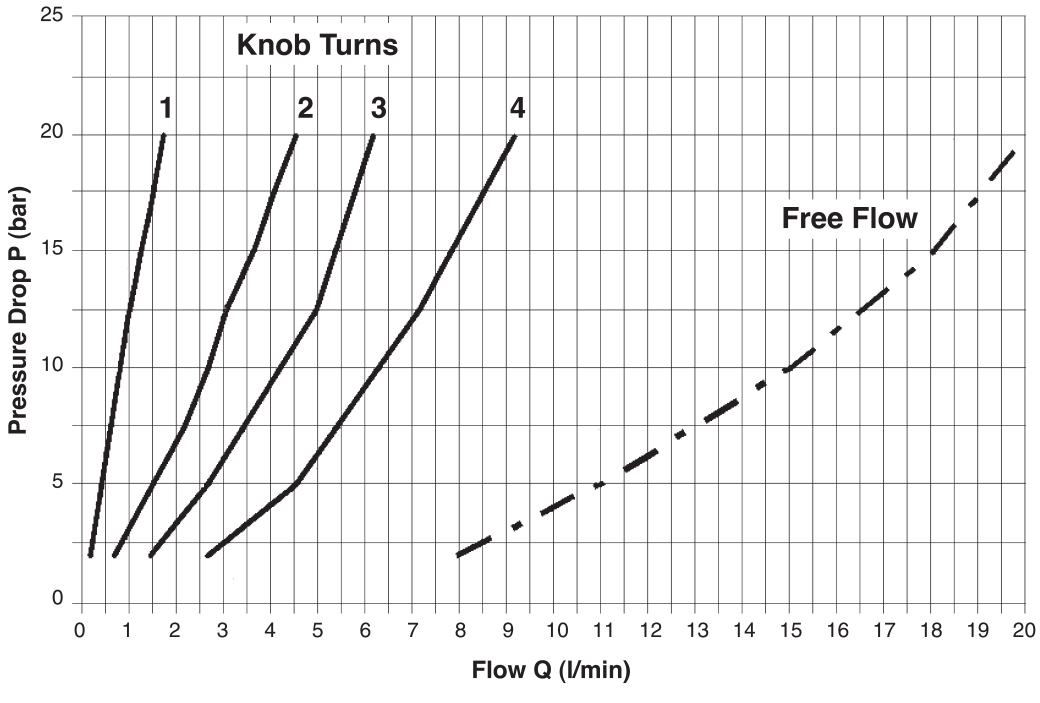


FUNCTIONAL SYMBOL

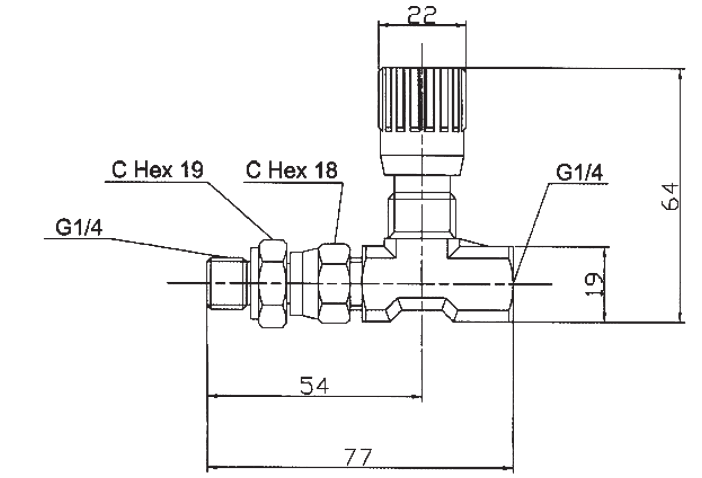


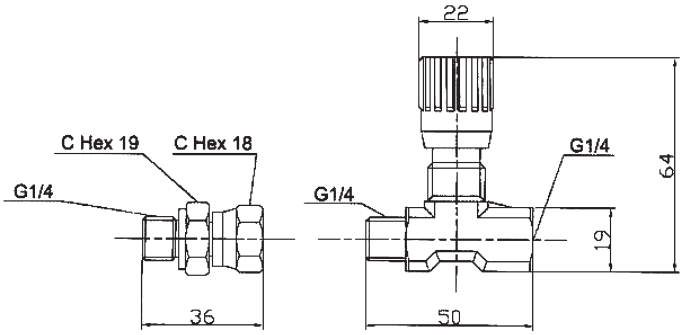


TYPICAL DIAGRAM



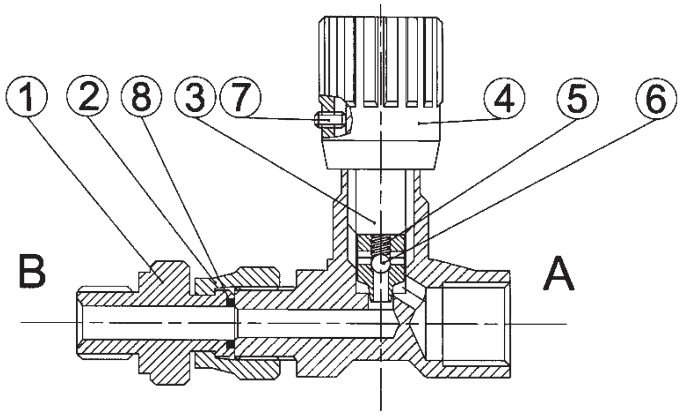
INSTALLATION DIMENSIONS





All dimensions are mm

TYPICAL SECTION



INSTALLATION

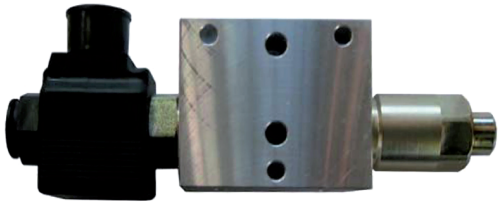
1. Lock the nipple **1** in a G1/4 port.
2. Put O-Ring® in its seat.
3. Fit the male thread of the valve in the turning connector.
4. While keeping the valve in the desired final orientation, screw the turning connector until blocking.

ADJUSTMENT OF THE REGULATED FLOW

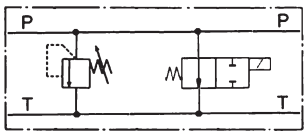
To reduce the flow rate in the regulated direction (A → B) turn clockwise knob **4**, after having unlocked its retaining screw **7**.

HYDRAULIC COMPACT STACKABLE MODULE AMF-MOP-EV
ELECTRIC BY-PASS / PRESSURE CONTROL

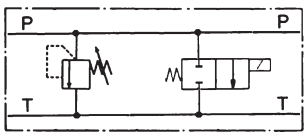
- Hydraulic valve module for pressure control and venting function, by standard 2-way solenoid operated valve and pressure relief valve.
- **AMF / HDF** interface, stackable assembly
- Max operating pressure: 250 bar
- Max recommended flow: 20 l/min
- Mass: 0,70 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt



SYMBOL



EV2O



EV2C

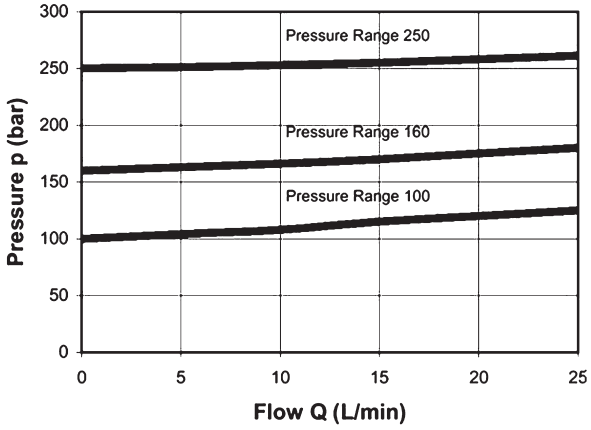
ORDERING CODE

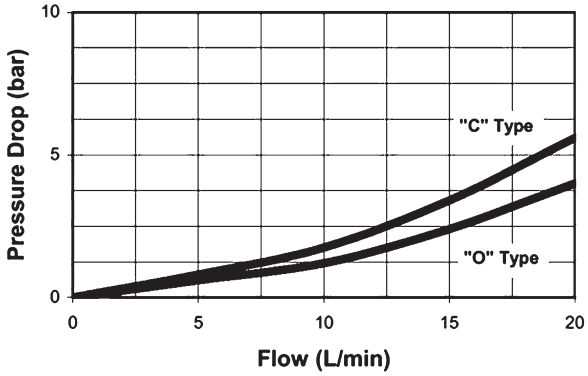
AMF – MOP/* – EV2O – 012C

AMF	AMF compact stackable valve
MOP/*	Pressure relief on P line – **(*)** setting range (**10**=32 to 100bar – **16**=63 to 160bar – **25**=100 to 250 bar)
EV2O	2-way solenoid operated valve for by-pass: **EV2O** = normally open **(see symbol)** **EV2C** = normally closed **(see symbol)**
012C	Standard coil voltage: **012C** = 12V DC **024C** = 24V DC (available on request 220V AC)

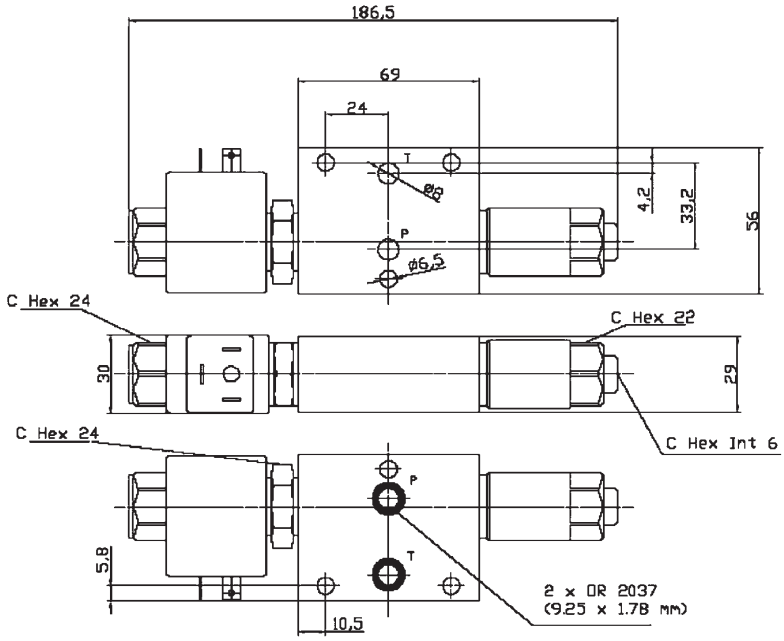
TYPICAL DIAGRAM

Typical **Δp-Q** curve diagram for pressure relief valve and **Δp-Q** curves for electric by-pass valve with mineral oil at 36cSt and 50°C

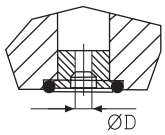




OVERALL DIMENSIONS

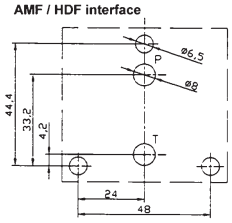


Available for P, and T lines
a restrictor with O ring



D (mm)	CODE
1,0	35-10
1,5	35-15
2,0	35-20
2,5	35-25

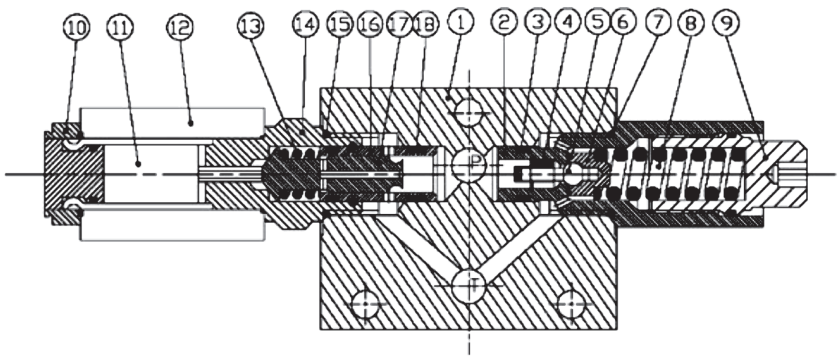
AMF / HDF interface



Subject to technical and dimensional changes without notice

TYPICAL SECTION

1	Main body	10	Ring nut
2	Pressure relief valve body	11	Solenoid
3	Seal	12	Coil
4	Piston guide	13	Spring
5	Piston	14	Cartridge
6	Piston holder	15	Seal
7	Seal	16	Valve body
8	Spring	17	Spool
9	Adjustment nut	18	Seal



COMPACT STACKABLE HAND PUMP type AMF-HP2

- Fixed displacement hand pump
- **AMF / HDF** interface, stackable assembly
- Max operating pressure : 200 bar
- Displacement: 2 cm^3
- Mass: 0,70 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
  Recommended viscosity range: 10 to 60cSt

SYMBOL

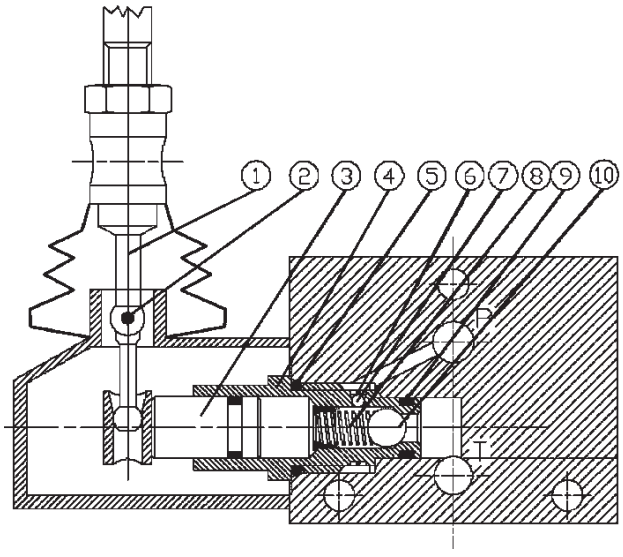
ORDERING CODE

AMF – HP2

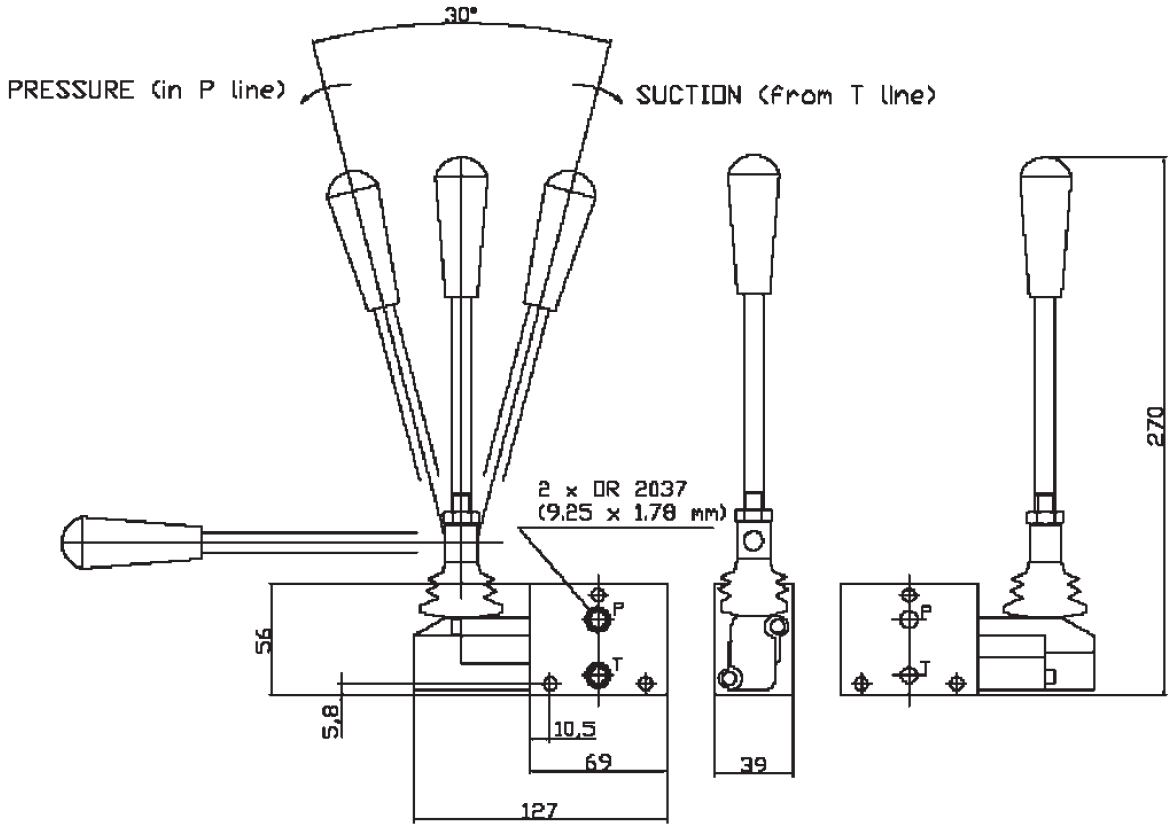
AMF	AMF compact stackable module
HP2	Hand pump, displacement 2 cm^3

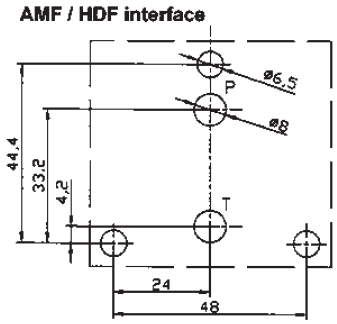
TYPICAL SECTION

1	Lever	6	Valves holder
2	Swivel	7	Outlet valve
3	Piston	8	Spring
4	Piston seat	9	Seal
5	Seal	10	Suction valve



OVERALL DIMENSIONS





SYSTEMS AND ACCESSORIES

AIR COOLED HEAT EXCHANGERS type MG AIR

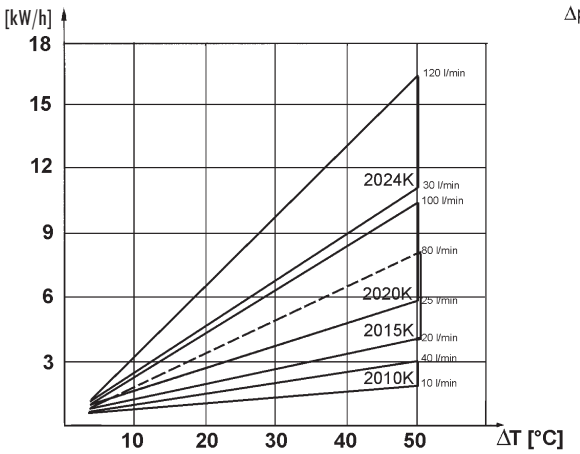
- Heat exchangers for oil cooling by means of a fan operated by an electric motor
- Radiant element in high-resistance aluminium alloy
- For installation on return line of the system in any position
- Fan motor voltage : 230V AC and 230-400V AC (on request 12-24V DC – IP64 or IP65)
- Suitable for mineral oils and water glycol fluids
- Max operating pressure : 20bar (test 35bar)
- Max oil temperature : 120°C
- Standard thermostat with fixed temperature (different types from 40°C to 90°C) and fixed hysteresis of 12°C

PERFORMANCE DATA

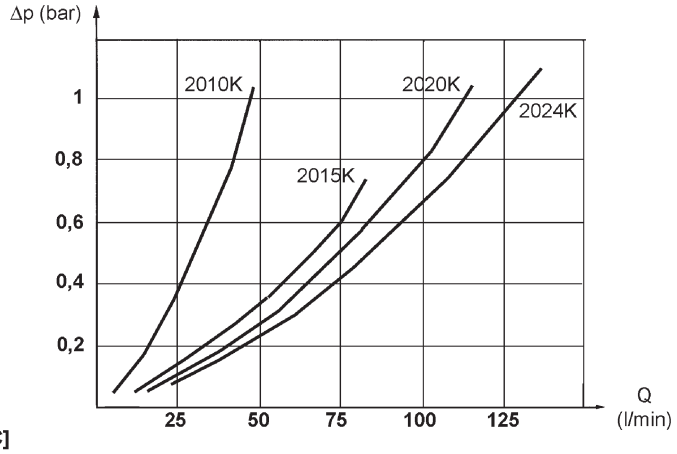
ORDERING CODE	OIL flow rate [l/min]	AIR flow rate [m3/h]	MASS [kg]	Voltage [V]	Frequency [Hz]	FAN absorption [kW]	IP Class
MG AIR 2010 K	10 to 40	235	6	230	50	0,05	54
MG AIR 2015 K	20 to 80	700	7	230	50	0,07	44
MG AIR 2020 K	25 to 100	645	8	230/400	50/60	0,07	44
MG AIR 2024 K	30 to 120	1300	11	230/400	50/60	0,10	44

TYPICAL DIAGRAM

Performance diagrams: typical exchanged energy [kW/h] at the maximum and minimum oil flow [l/min], depending on oil/air temperature difference ΔT [°C].

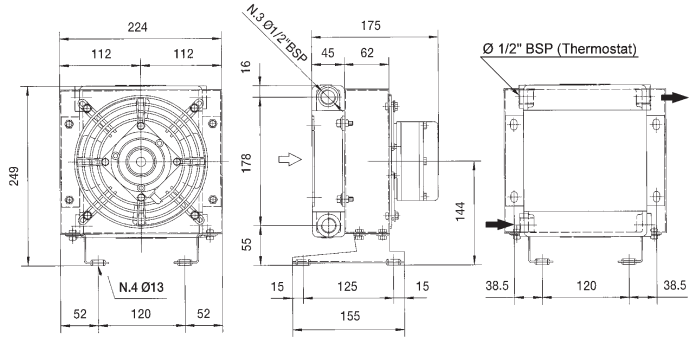


Pressure drops: typical Δp-Q curves with mineral oil and viscosity at 32cSt

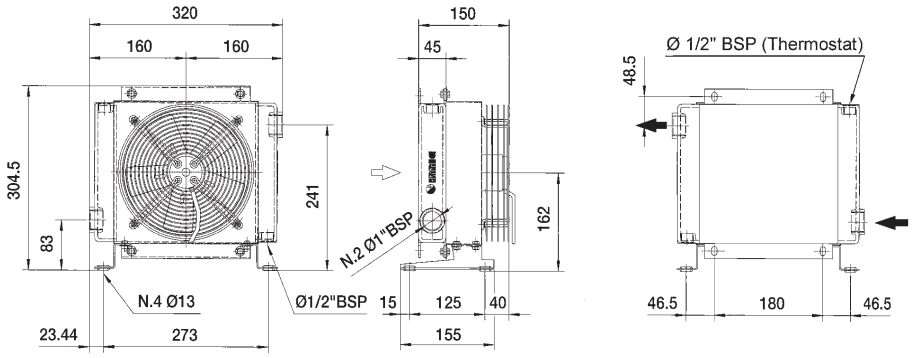


OVERALL DIMENSIONS

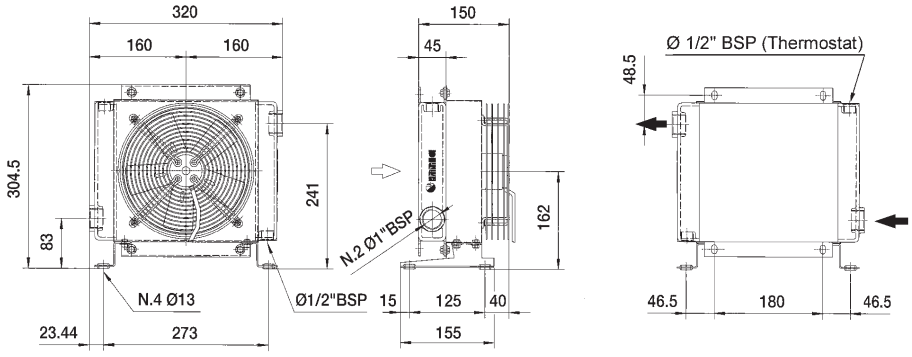
2010 K



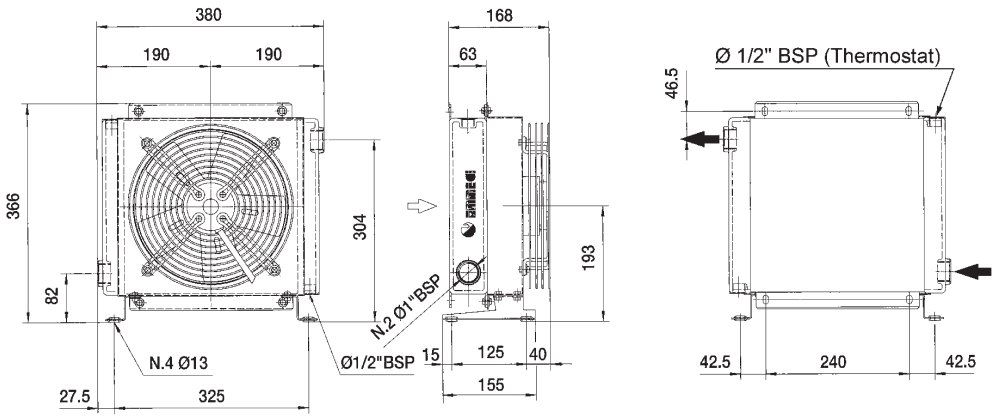
2015 K



2020 K



2024 K



Subject to technical and dimensional changes without notice

WATER COOLED HEAT EXCHANGERS type MG

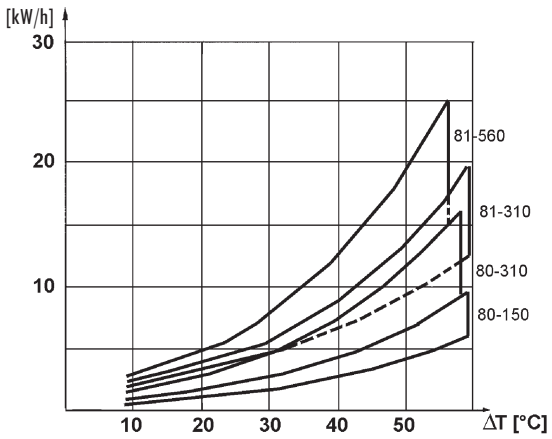
- Heat exchangers for oil cooling
- 4 circuits fresh water system
- For installation on return line of the system in horizontal position
- Suitable for mineral oils and water glycol fluids
- Max operating pressure : 12bar (test 18bar)
- Max operating temperature : 120°C

TECHNICAL DATA

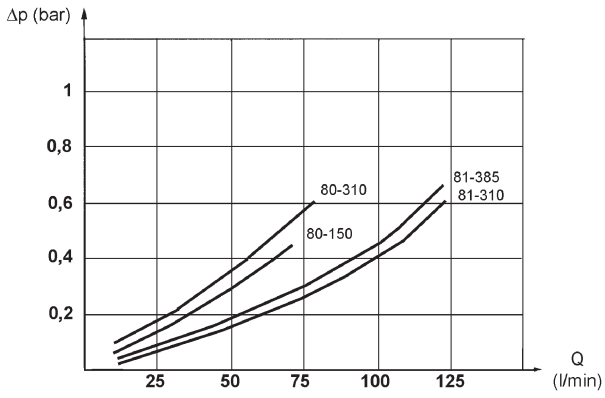
ORDERING CODE	OIL flow rate [l/min]	DISSIPATED ENERGY (Oil 55°C / Water 20°C) [kW]	
MG 80-150/4	25 to 75	3 to 6	- Water flow rate: 1 l/min each kW/h to be dissipated - Oil flow rates indicated are suggested for the best performance - For different temperatures of cooling water use following correction factors: 25°C=0,88 - 30°C=0,75 - 35°C=0.65
MG 80-310/4	25 to 80	5 to 10	
MG 81-310/4	50 to 120	8 to 13	
MG 81-560/4	60 to 150	12 to 18	

TYPICAL DIAGRAMS

Performance diagrams: typical energy dissipation at the maximum and minimum oil flow, depending on oil/water temperature difference.

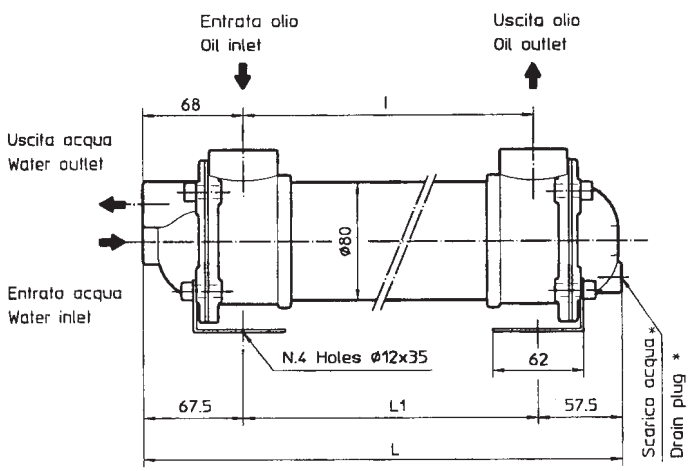


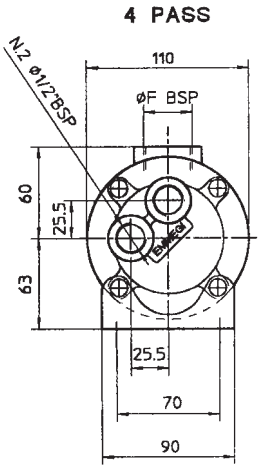
Pressure drops: typical Δp-Q curves with mineral oil and viscosity at 32cSt



OVERALL DIMENSIONS

MG 80

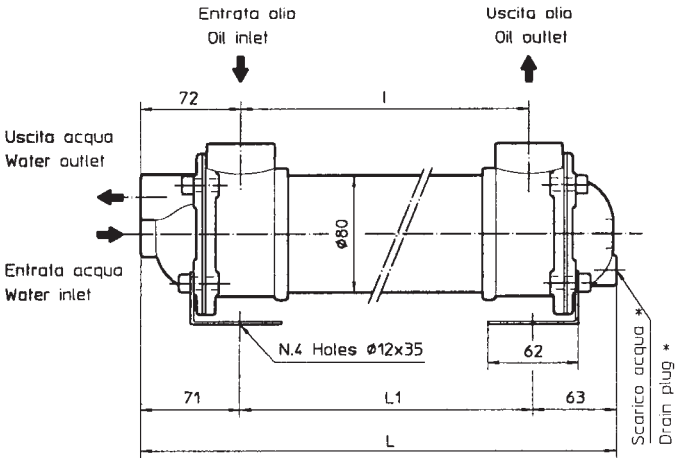


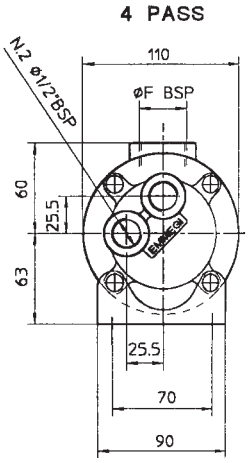


TECHNICAL DATA

TYPE	ØF	l [mm]	L [mm]	L1 [mm]	MASS [kg]
MG 80-150/4	1"	150	275	148	4,5
MG 80-310/4	1"	310	435	308	5,7

MG 81





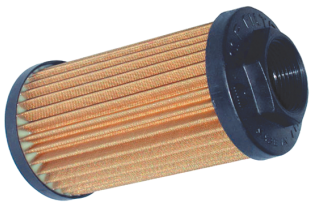
TECHNICAL DATA

TYPE	ØF	l [mm]	L [mm]	L1 [mm]	MASS [kg]
MG 81-310/4	1 ½"	310	275	148	5,7
MG 81-560/4	1 ½"	560	435	308	7,5

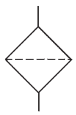
Subject to technical and dimensional changes without notice

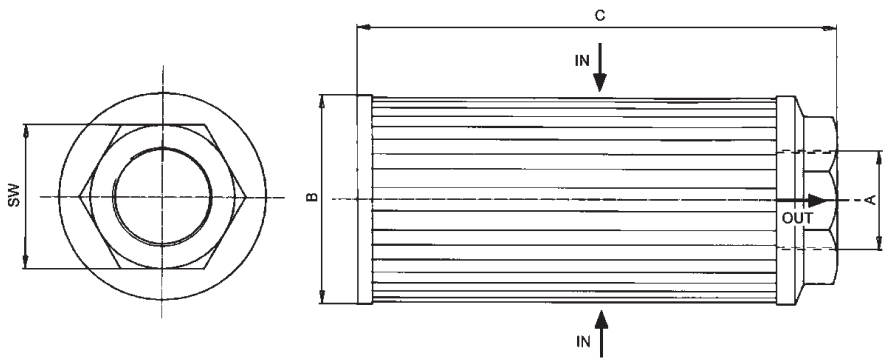
HYDRAULIC SUCTION FILTERS type STR

- Designed to be installed on the pump suction line immersed in the fluid
- Filtering element in metallic net with square mesh
- Filtration rate: 90µm
- Filtering element collapse: 1 bar
- When clogged, the filter must be entirely replaced



TECHNICAL DATA and DIMENSIONS

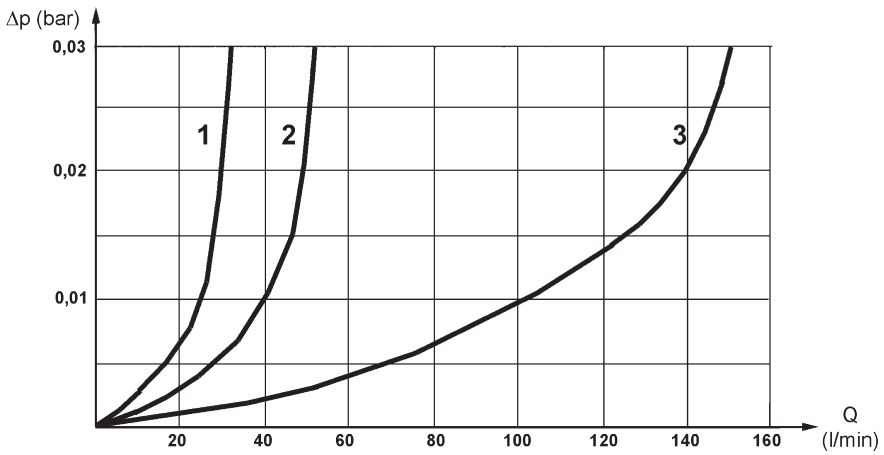
ORDERING CODE	Symbol	QMAX [l/min]	Filtration rate [µm]	A	B [mm]	C [mm]	SW [mm]	Mass [kg]
STR 0702 SG1M90		35	90	3/4" BSP	70	95	42	0,22
STR 0704 SG1M90		55	90	1" BSP	70	140	42	0,30
STR 1005 SG1M90		150	90	1 ½" BSP	99	135	69	0,47



Subject to technical and dimensional changes without notice

TYPICAL DIAGRAMS

Typical Δp-Q curves for STR suction filters with mineral oil at 42cSt and 60°C

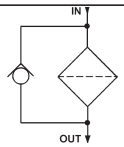


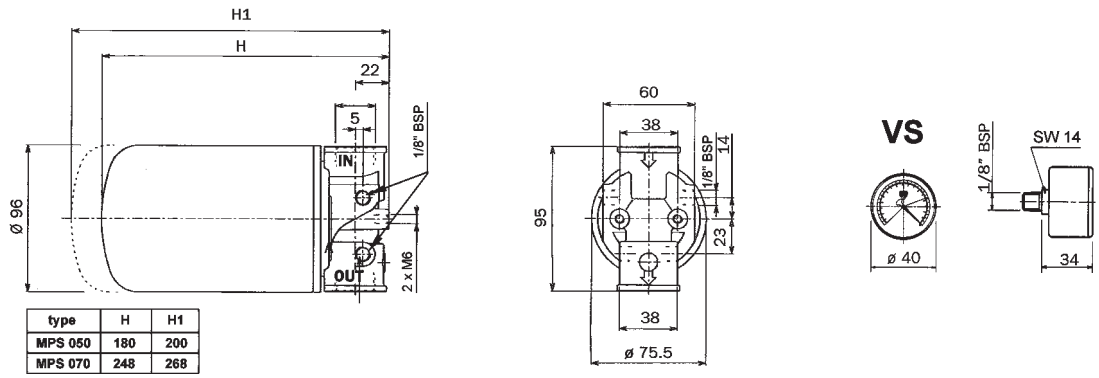
1) STR 0702 SG1M90 2) STR 0704 SG1M90 3) STR 1005 SG1M90

HYDRAULIC SPIN-ON FILTERS type MPS STR

- Designed to be installed on return line
- Filtering element in paper
- Filtration standard rate: 25µm
- Max operating pressure: 12bar
- Equipped with a by-pass valve (opening $\Delta p = 1,75$bar)
- Visual clogging indicator
- When clogged, the filtering cartridge must be replaced

TECHNICAL DATA and DIMENSIONS

ORDERING CODE	Symbol	QMAX [l/min]	PMAX [bar]	Filtration rate(*) [µm]	Ports	Mass [kg]	Clogging indicator	Filtering element
MPS 050 CG1 P25A		see below	12	25	3/4" BSP	1,0	VS visual	CS 050 P25A B
MPS 070 CG1 P25A		diagrams	12	25	3/4" BSP	1,3	VS visual	CS 070 P25A B

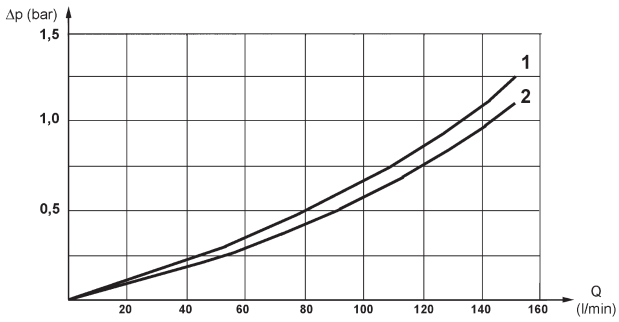


type	H	H1
MPS 050	180	200
MPS 070	248	268

Subject to technical and dimensional changes without notice

TYPICAL DIAGRAMS

Typical Δp-Q curves for MPS spin-on filters with mineral oil at 42cSt and 60°C



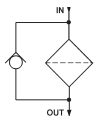
1) MPS 050 CG1 P25A 2) MPS 070 CG1 P25A

Diagrams refer to pressure loss through filter body+standard filtering element. In case of different filtering element ask our technical department

HYDRAULIC IN-LINE FILTERS type FH*
HIGH PRESSURE SERIES

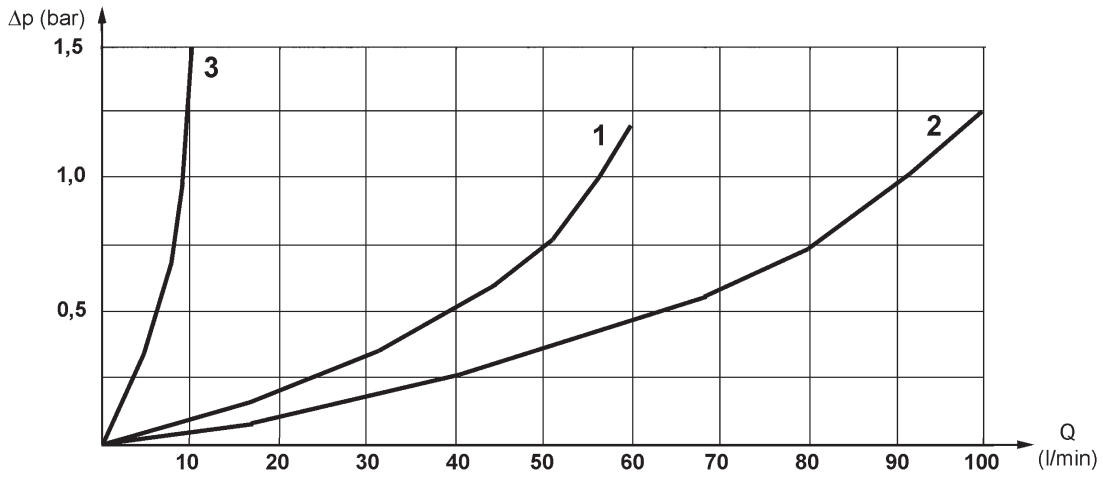
- Designed to be installed on pressure line in order to protect the circuit components
- FHM type for intermediate ISO 03 stackable assembly
- Filtering element made by inorganic micro fibre with acrylic support
- Filtration standard rate: 25µm
- Filtering element collapse: 20bar (FHP), 210bar (FHM)
- FHP types are equipped with a by-pass valve (opening Δp=6bar)
- Visual or electrical clogging indicator
- When clogged, the filtering element must be replaced

TECHNICAL DATA and DIMENSIONS

ORDERING CODE	Symbol	QMAX [l/min]	PMAX [bar]	Filtration rate(*) [µm]	Ports	Mass [kg]	Clogging indicator	Filtering element
FHP 0651 BAG2 A25N		60	420	25	3/4" BSP	3,9	V7 visual E8 electrical	HP0651A25N
FHP 1352 BAG2 A25N		100	420	25	1" BSP	9,4	V7 visual E8 electrical	HP1352A25N
FHM 0061 SAG1 A25H		10	320	25	ISO 03 surface	2,4	V7 visua E8 electrical	HP0201A25H

TYPICAL DIAGRAMS

Typical Δ p-Q curves for FH* in-line filters with mineral oil at 42cSt and 60°C

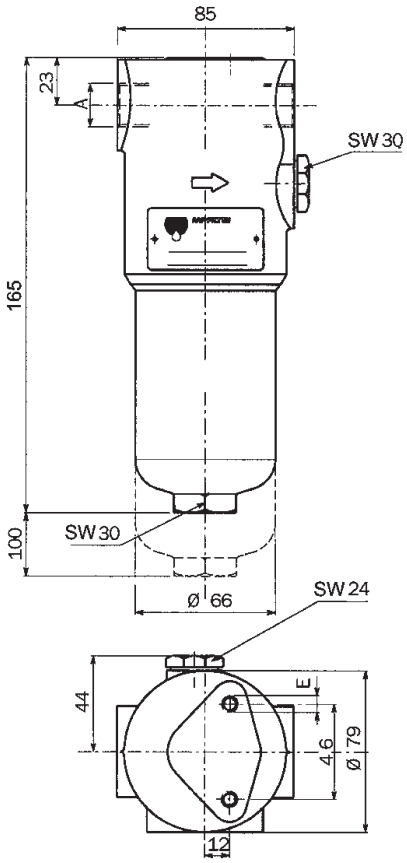


1) FHP 0651 BAG2 A25N 2) FHP 1352 BAG2 A25N 3) FHM 0061 SAG1 A25H

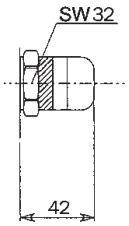
Diagrams refer to pressure loss through filter body+standard filtering element. In case of different filtering element ask our technical department

OVERALL DIMENSIONS

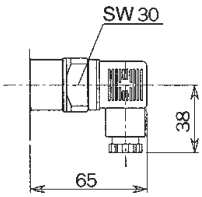
FHP 0651



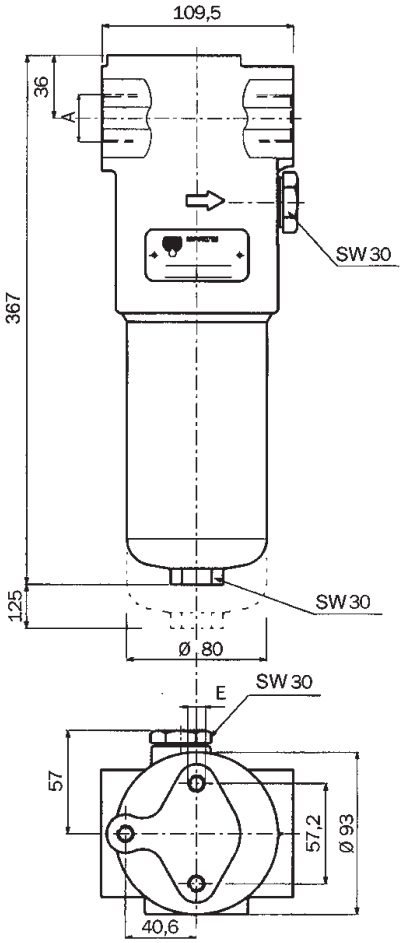
V7



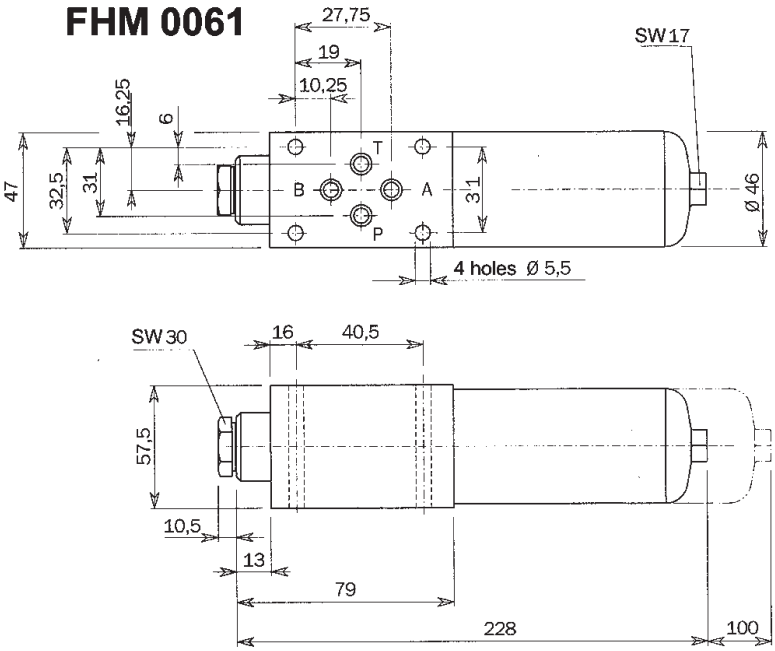
E8



FHP 1352



FHM 0061

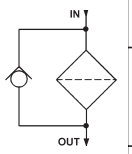


Subject to technical and dimensional changes without notice

HYDRAULIC RETURN FILTERS type MPH

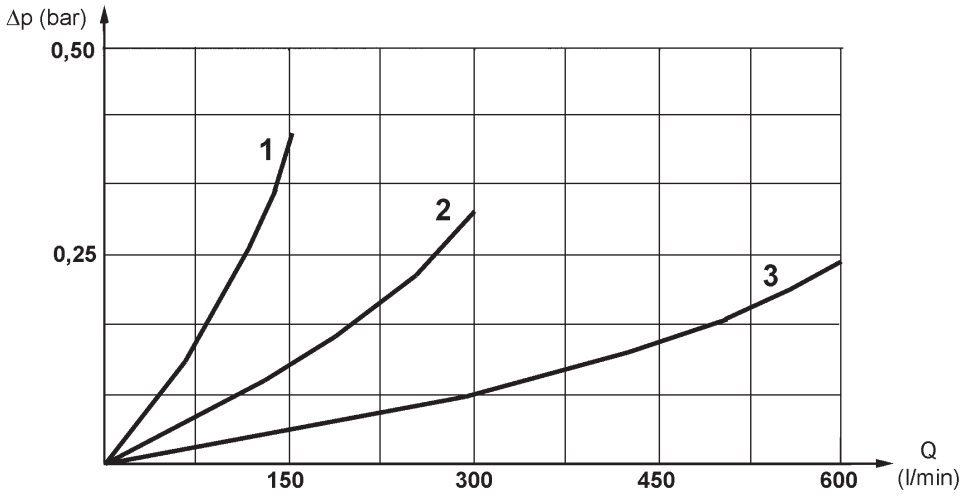
- Designed to be installed on the reservoir cover and connected to the return line
- Filtering element made by inorganic micro fibre
- Filtration standard rate: 25µm
- Filtering element collapse: 10bar
- Equipped with a by-pass valve (opening $\Delta p = 2,5$bar)
- Visual or electrical clogging indicator
- When clogged, the filtering element must be replaced

TECHNICAL DATA and DIMENSIONS

ORDERING CODE	Symbol	QMAX [l/min]	PMAX [bar]	Filtration rate(*) [µm]	Ports	Mass [kg]	Clogging indicator	Filtering element
MPH 1002 CDSAG2 A25		150	10	25	3/4" BSP	1,2	VR visual FX electrical	MR1002A25A
MPH 2502 CDSAG1 A25		300	10	25	1" ½ BSP	4,1	VR visual FX electrical	MR2502A25A
MPH 6302 CDSAF1 A25		600	10	25	2" ½ SAE	8,7	VR visual FX electrical	MR6302A25A

TYPICAL DIAGRAMS

Typical Δp-Q curves for MPH return filters with mineral oil at 42cSt and 60°C

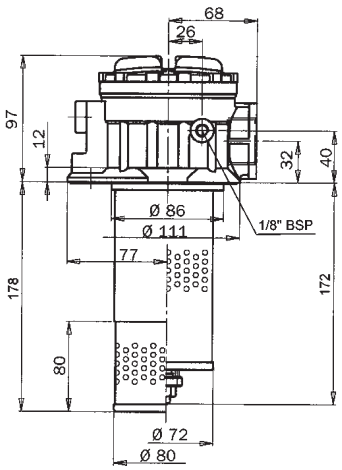


1) MPH 1002 CDSAG2 A25 2) MPH 2502 CDSAG1 A25 3) MPH 6302 CDSAF1 A25

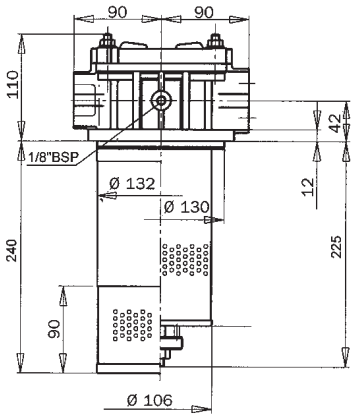
Diagrams refer to pressure loss through filter body+standard filtering element. In case of different filtering element ask our technical department

OVERALL DIMENSIONS

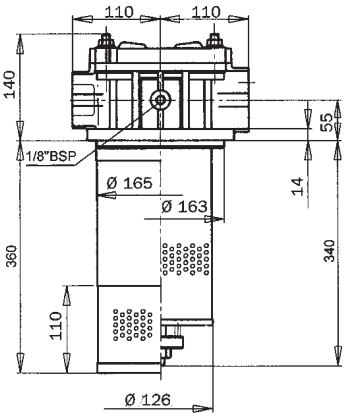
MPH 1002

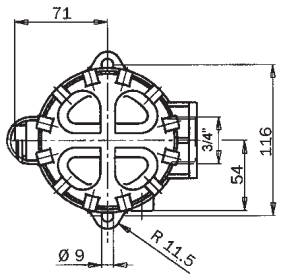


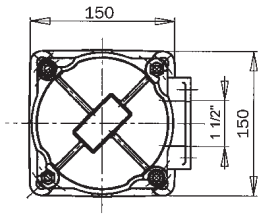
MPH 2502

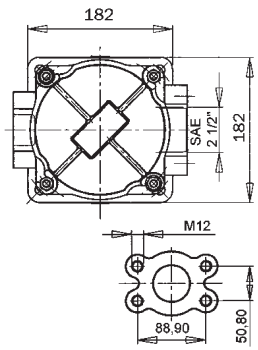


MPH 6302

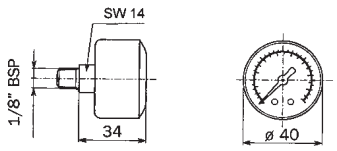




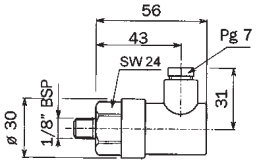




VR



FX15R2M3



OIL-FILLING GROUP type 50300A

- Group for filtering and transferring of oil
  The group includes:
- Vane pump 25l/min, with pressure relief valve incorporated
- Eletric motor 0,75 Kw - 230 VAC monophase,
  with thermal protection and “on/off” button
- Spin-on filter with 10µ paper cartridge
- Filter clogging indicator
- Transparent flexible hoses for suction and return
- Tubular structure in painted steel
- Total mass: 28 kg

OVERALL DIMENSIONS