CD1-W

DIRECT OPERATED PRESSURE CONTROL VALVE

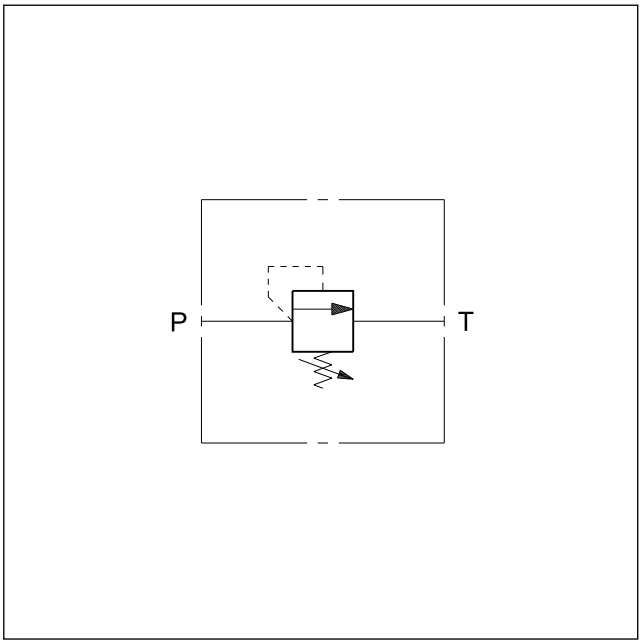
SERIES 10

THREADED PORTS

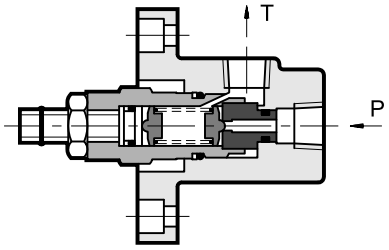
p max **350** bar

Q max **3** l/min

HYDRAULIC SYMBOL



OPERATING PRINCIPLE



— The CD1-W valve is a direct operated pressure control valve with threaded ports and for flange mounting installation.

— It is used also for remote piloting of control valves and two-stage pressure reducers.

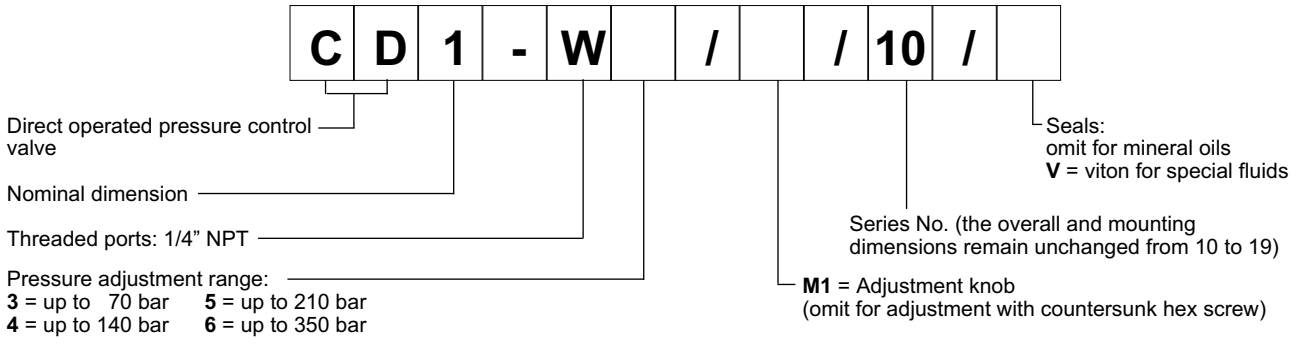
— It is available in four different pressure control ranges up to 350 bar.

— It is normally supplied with a countersunk hex adjustment screw, a locking nut and a maximum adjustment fastener.

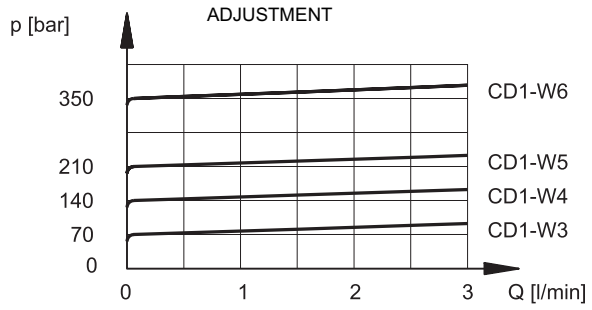
PERFORMANCE RATINGS (measured with mineral oil of viscosity 36 cSt at 50°C)

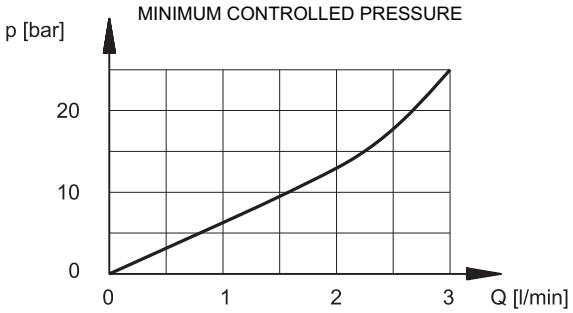
Maximum operating pressure	bar	350
Minimum controlled pressure	see diagram	
Maximum flow rate	l/min	3
Ambient temperature range	°C	–20 / +50
Fluid temperature range	°C	–20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Recommended filtration		according to ISO4406:1999 class 20/18/15
Recommended viscosity	cSt	25
Mass	kg	1,2

1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



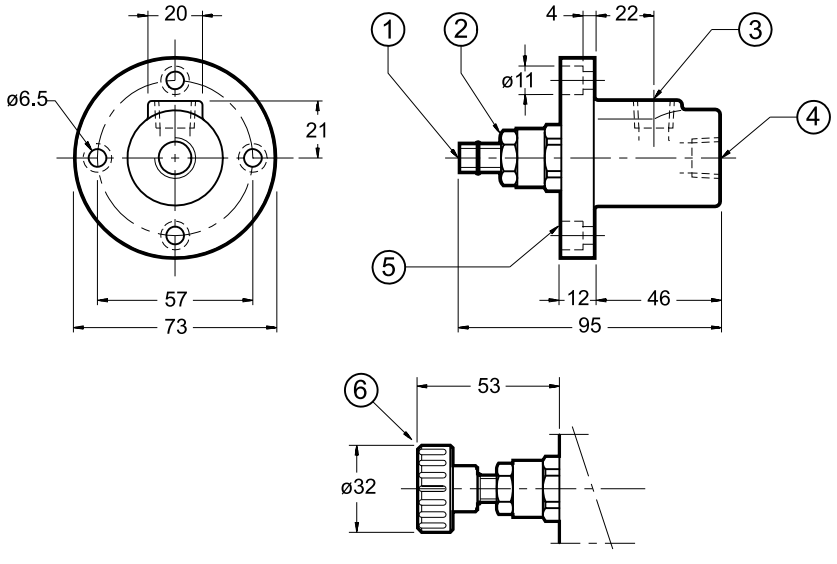


3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.
The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



1	Countersunk hex adjustment screw: spanner 5 Clockwise rotation to increase pressure
2	Locking nut: spanner 17
3	Outlet port T: 1/4" NPT
4	Pressure port P: 1/4" NPT
5	Identification label
6	Adjustment knob: M1

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com

RM*-W

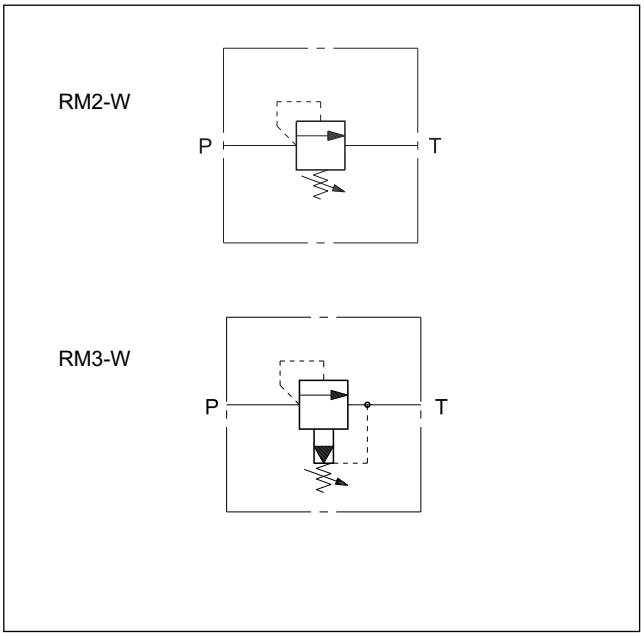
PRESSURE CONTROL VALVES

RM2-W SERIES 31
RM3-W SERIES 30

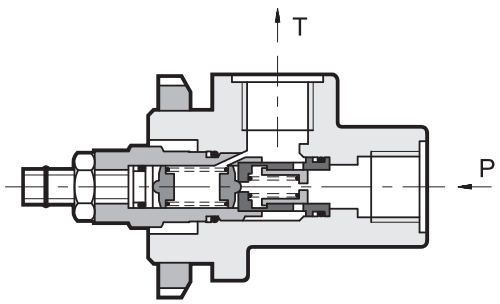
THREADED PORTS

p max **350** bar
Q max (see table of performances)

HYDRAULIC SYMBOLS



OPERATING PRINCIPLE



— The RM*-W valves are pressure control valves with threaded ports for panel mounting with a ring-nut fastening.

— They are available in two different sizes: RM2-W direct operated for flows up to 50 l/min; RM3-W pilot operated for flows up to 75 l/min.

— They are normally supplied with a countersunk hex adjustment screw, a locking nut and a maximum adjustment fastener.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RM2-W	RM3-W
Maximum operating pressure	bar	350	
Minimum controlled pressure	see diagram		
Maximum flow rate	l/min	50	75
Ambient temperature range	°C	-20 / +50	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 ÷ 400	
Fluid contamination degree	according to ISO 4406:1999 class 20/18/15		
Recommended viscosity	cSt	25	
Mass	kg	0,9	

1 - IDENTIFICATION CODE

R	M		-	W		/					

Example: RM2-W3/31N/K
RM3-W3/M1/30/V

Pressure control valve

Nominal dimension:
2 = 3/8” **3** = 1/2”

Threaded ports BSP

Pressure adjustment range:
3 = up to 70 bar **5** = up to 210 bar
4 = up to 140 bar **6** = up to 350 bar

only for RM3: **M1** = Adjustment knob
(omit for adjustment with countersunk hex screw)

only for RM2: Seals
N = NBR seals for mineral oils (**standard**)
V = FPM seals for special fluids

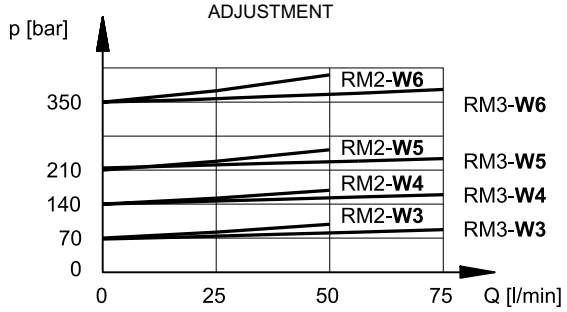
Series no: **31** for RM2-W **30** for RM3-W

only for RM3: Seals
Omit for NBR seals for mineral oils (**standard**)
/V = FPM seals for special fluids

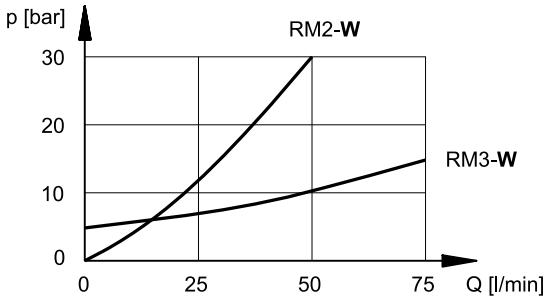
only for RM2: /**K** = Adjustment knob
(omit for adjustment with countersunk hex screw)

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

ADJUSTMENT



MINIMUM CONTROLLED PRESSURE

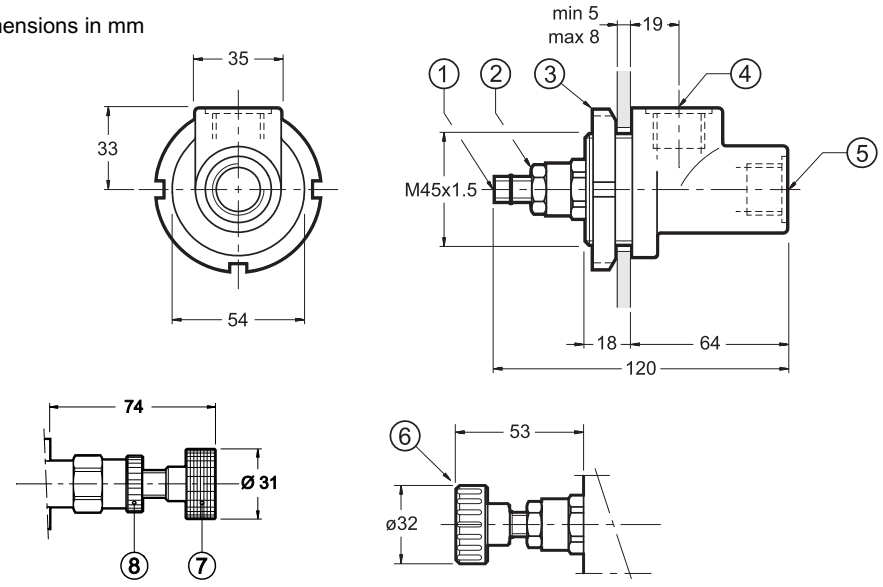


3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.
The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



1	Countersunk hex adjustment screw: **RM2-W**: spanner 6 **RM3-W**: spanner 5 Clockwise rotation to increase pressure
2	Locking nut: **RM2-W**: spanner 19 **RM3-W**:spanner 17
3	Ring-nut for flange mounting type SKF KM9
4	Outlet port 1/2” BSP
5	Pressure port: **RM2-W**: 3/8” BSP **RM3-W**: 1/2” BSP
6	Adjustment knob: **RM3-W**: **M1**
7	Adjustment knob: **RM2-W**: **K**
8	Locking ring

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com

RQ*-W

PRESSURE RELIEF VALVE

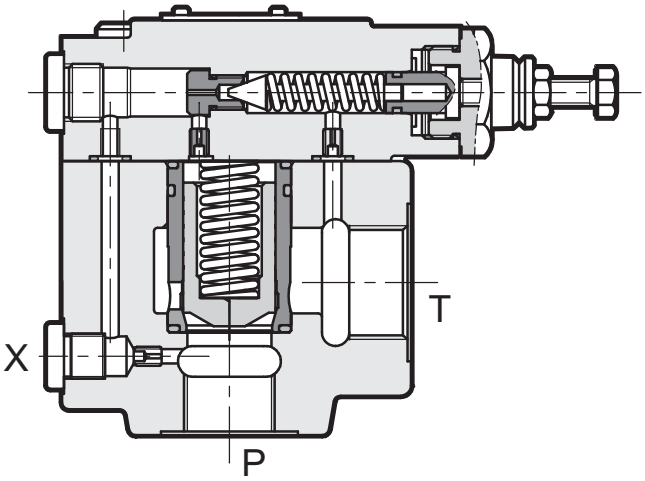
SERIES 41

THREADED PORTS

p max **350** bar

Q max (see table of performances)

OPERATING PRINCIPLE



— The RQ*-W valves are pilot operated pressure relief valves with threaded ports, available in two nominal sizes for a flow rate up to 400 l/min.

— Main stage with shutter and cone seal.

— Possibility of remote piloting using port X (see par. 4).

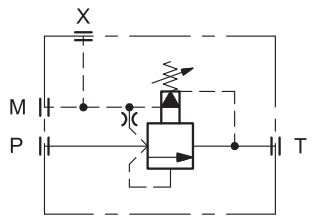
— The valves allow the use of the entire flow of the pump even with pressure values near the set value. The wide passages allow reduced pressure drops and fluid heating due to low pressure drop across the valve.

— They are normally supplied with a hexagonal head adjustment screw. Upon request, they can be equipped with a SICBLOC adjustment knob.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQ5-W	RQ7-W
Maximum operating pressure	bar	350	
Maximum flow rate	l/min	250	400
Ambient temperature range	°C	-20 / +50	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 ÷ 400	
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15		
Recommended viscosity	cSt	25	
Mass	kg	4,1	8

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

R	Q		-	W		/		/	41	/	

Pressure control valve

Nominal dimension **5** = DN 25
7 = DN 40

BSP threaded ports

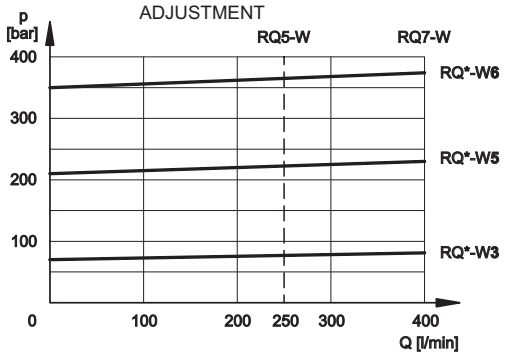
Pressure adjustment range:
3 = up to 70 bar
5 = up to 210 bar
6 = up to 350 bar

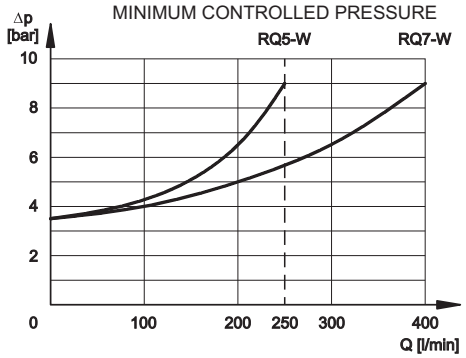
M = adjustment with SICBLOC knob
(omit for adjustment with hexagonal head screw)

Series No. (the overall and mounting dimensions remain unchanged from 40 to 49)

Seals:
omit for mineral oils
V = viton for special fluids

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

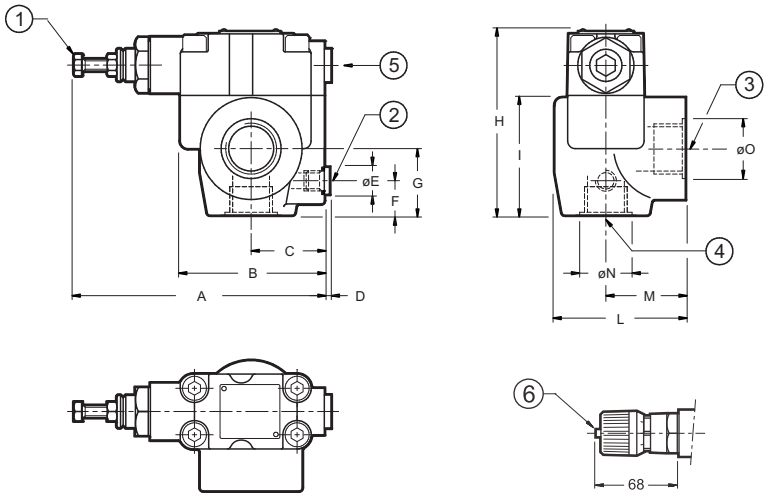




3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.
The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS



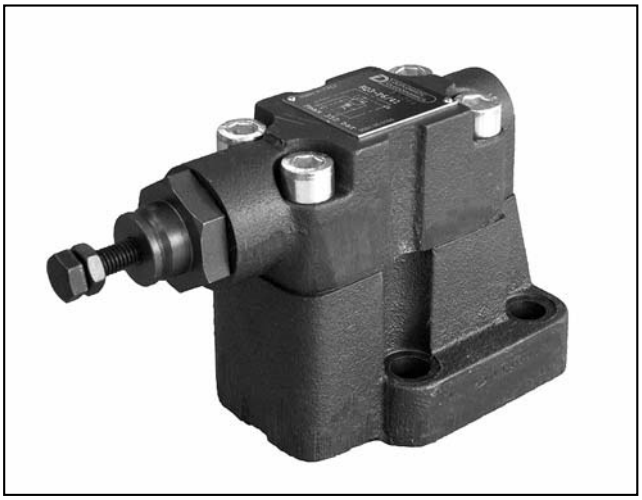
dimensions in mm

1	Hexagonal head adjustment screw. Spanner 13. Clockwise rotation to increase pressure
2	Remote piloting port X: 1/4" BSP
3	Outlet port T **RQ5-W**: 1" BSP **RQ7-W**: 1" 1/2 BSP
4	Pressure port P **RQ5-W**: 3/4" BSP **RQ7-W**: 1" 1/4 BSP
5	Pressure gauge port 3/8" BSP
6	SICBLOC adjustment knob. To operate, push and rotate at the same time.

	A	B	C	D	ØE	F	G	H	I	L	M	ØN	ØO
RQ5-W	168	98	49	4	22	21.5	44.5	123	80	87	53	35.5	46
RQ7-W	168	98	49	4	22	43	59.5	145	102	109	68	50	56

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com



RQ*-P

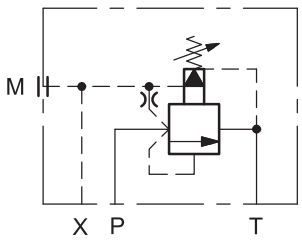
PRESSURE RELIEF VALVES

SERIES 41

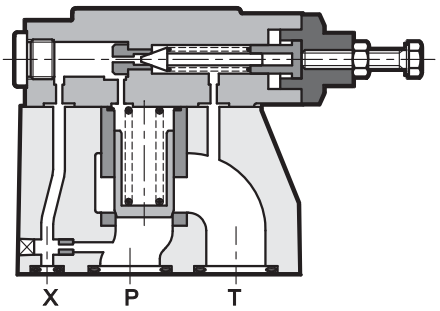
SUBPLATE MOUNTING

RQ3-P ISO 6264-06 (CETOP R06)
RQ5-P ISO 6264-08 (CETOP R08)
RQ7-P ISO 6264-10 (CETOP R10)

HYDRAULIC SYMBOL



OPERATING PRINCIPLE



— Pilot operated pressure relief valve; main stage with shutter and cone seal.

— Subplate mounting in accordance with ISO 6264 (CETOP RP 121H) standards.

— Possibility of remote piloting using port X (see Hydraulic symbol table).

— The RQ*-P valves allow use of the entire flow of the pump even with pressure values near the set value.

— The wide passages allow reduced pressure drops, improving the energy efficiency of the plant.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQ3-P	RQ5-P	RQ7-P
Maximum operating pressure	bar	350		
Maximum flow rate	l/min	200	400	500
Ambient temperature range	°C	-20 / +50		
Fluid temperature range	°C	-20 / +80		
Fluid viscosity range	cSt	10 ÷ 400		
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15			
Recommended viscosity	cSt	25		
Mass	kg	3,5	4,3	6,5

1 - IDENTIFICATION CODE

R	Q		-	P		/		/	41	/	

Double stage pressure relief valve

Size: **3** = ISO 6264-06 (CETOP R06)
5 = ISO 6264-08 (CETOP R08)
7 = ISO 6264-10 (CETOP R10)

Subplate mounting

Pressure adjustment range:
3 = up to 70 bar **6** = up to 350 bar
5 = up to 210 bar

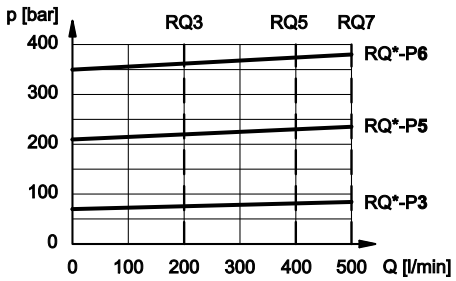
M = adjustment with SICBLOC knob
(omit for adjustment with hexagonal head screw)

Series No.
(the overall and mounting dimensions remain unchanged from 40 to 49)

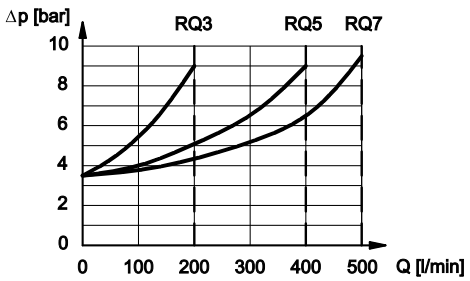
Seals: omit for mineral oils
V = viton for special fluids

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

ADJUSTMENT



MINIMUM CONTROLLED PRESSURE

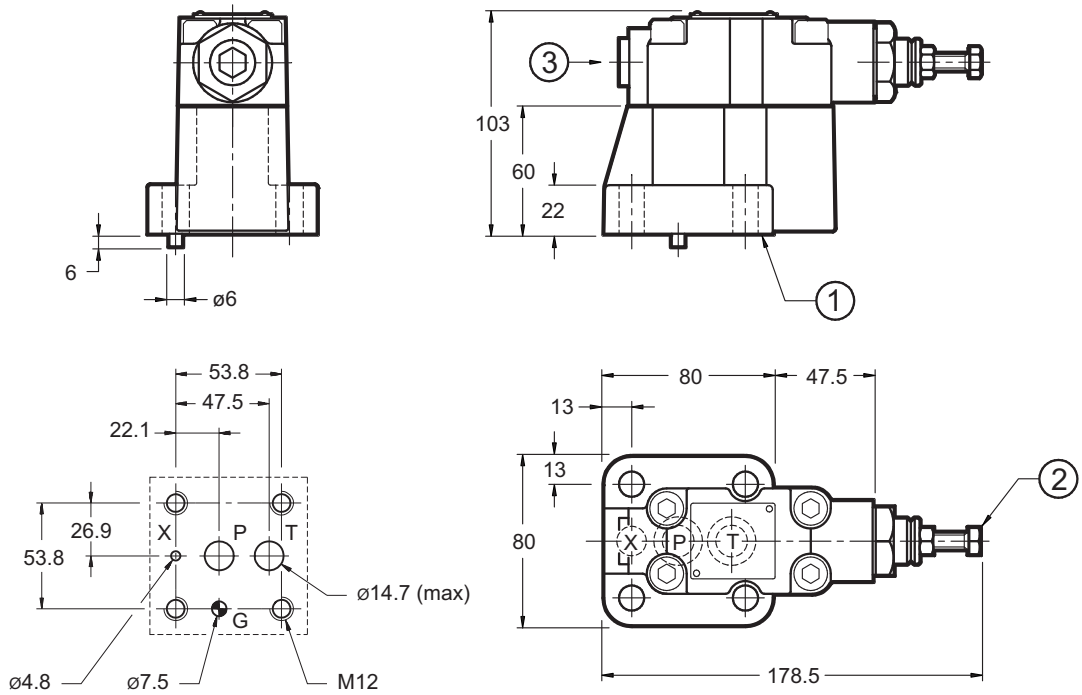


3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - RQ3-P OVERALL AND MOUNTING DIMENSIONS



dimensions in mm

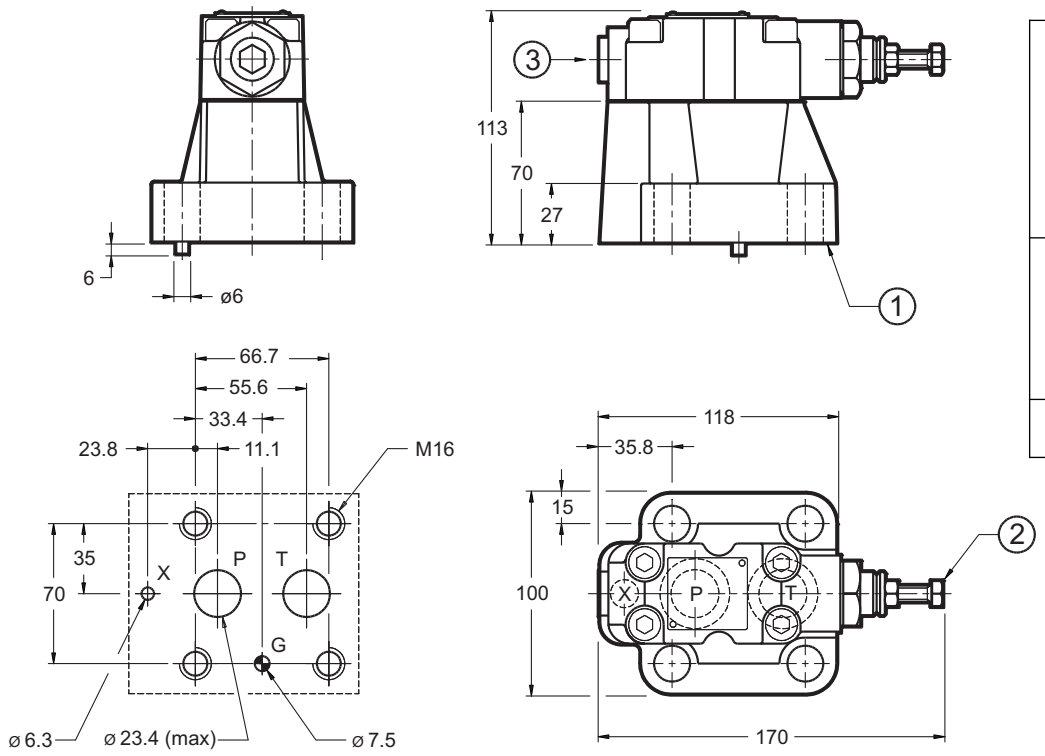
1	Mounting surface with sealing rings: 2 OR type 123 (17.86x2.62) 90 Shore 1 OR type 109 (9.13x2.62) 90 Shore
2	Hexagonal head adjustment screw. Spanner 13. Clockwise rotation to increase pressure.
3	Pressure gauge port Y 3/8" BSP

FASTENING BOLTS:
4 SHC bolts M12x40
Tightening torque: 69 Nm

MOUNTING SURFACE: ISO 6264-06-09-*-97 (CETOP 4.4.2-2-R06-350)

5 - RQ5-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



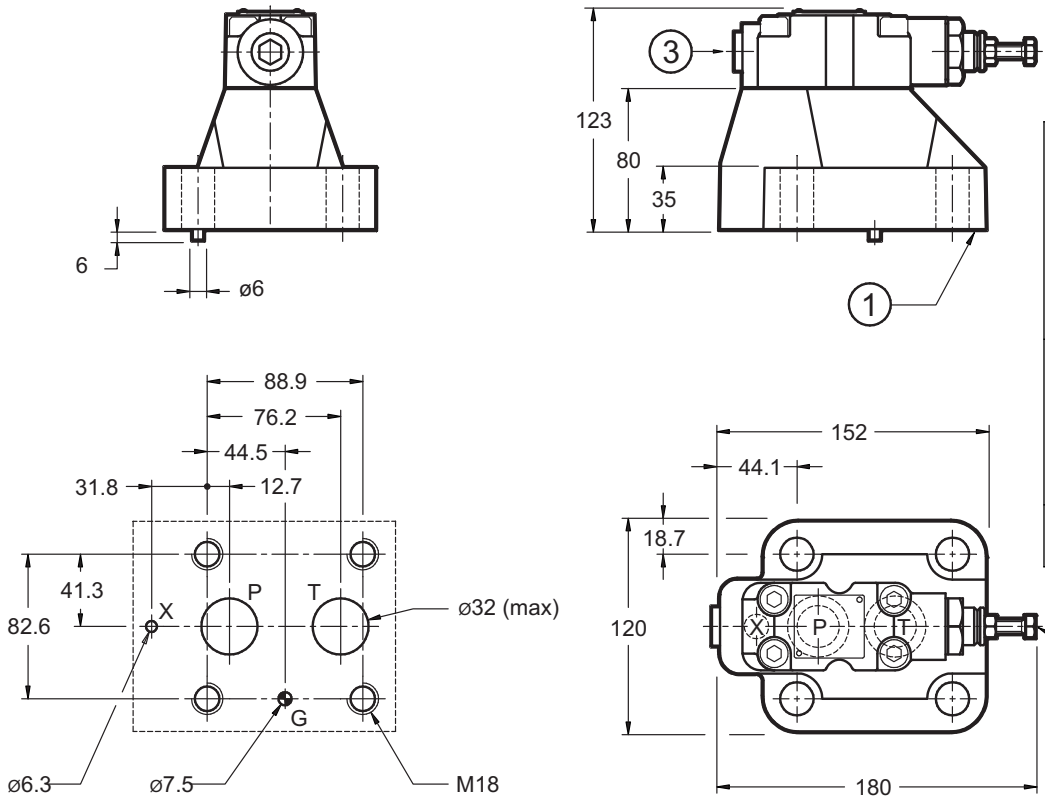
1	Mounting surface with sealing rings: N. 2 OR 3118 (29.82x2.62) 90 Shore N. 1 OR 109 (9.13x2.62) 90 Shore
2	Hexagonal head adjustment screw. Spanner 13. Clockwise rotation to increase pressure.
3	Pressure gauge port 3/8" BSP

FASTENING BOLTS:
4 SHC bolts M16x50
Tightening torque 170 Nm

MOUNTING SURFACE: ISO 6264-08-13-*-97 (CETOP 4.4.2-2-R08-350)

6 - RQ7-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



1	Mounting surface with sealing rings: N. 2 OR 4137 (34.52x3.53) 90 Shore N. 1 OR 109 (9.13x2.62) 90 Shore
2	Hexagonal head adjustment screw. Spanner 13. Clockwise rotation to increase pressure.
3	Pressure gauge port 3/8" BSP

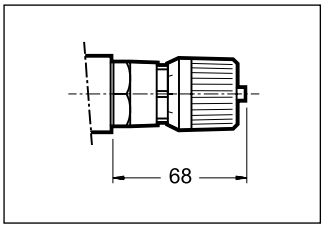
FASTENING BOLTS:
4 SHC bolts M18x60
Tightening torque: 235 Nm

MOUNTING SURFACE: ISO 6264-10-17-*-97 (CETOP 4.4.2-2-R10-350)

7 - ADJUSTMENT KNOB

The RQ valves can be equipped with a SICBLOC adjustment knob. To operate it, push and rotate at the same time.

To request this option, add: **/M** (see paragraph 1).



8 - SUBPLATES (see catalogue 51 000)

	RQ3-P	RQ5-P	RQ7-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports
P, T ports dimension	P: 1/2” BSP T: 3/4” BSP	1” BSP	1” 1/4 BSP
X port dimension	1/4” BSP	1/4” BSP	1/4” BSP

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com

RQM*-W

SOLENOID OPERATED PRESSURE RELIEF VALVE WITH UNLOADING AND PRESSURE SELECTION

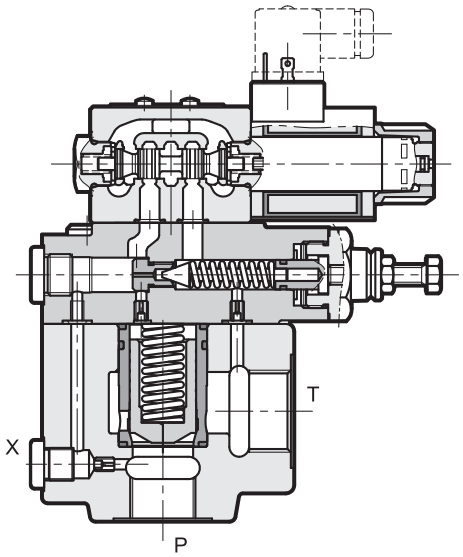
SERIES 60

THREADED PORTS

p max **350** bar

Q max (see table of performances)

OPERATING PRINCIPLE



— The RQM*-W valves are pilot operated pressure relief valves with BSP threaded ports, available in two nominal sizes for a flow rate up to 400 l/min.

— Available in five versions that allow, by means of a solenoid valve, unloading of the total flow and selection up to three pressure values (see table 2 for different versions).

— The adjustment of the second and third pressure value is obtained by a pressure relief valve placed between the main stage and the solenoid valve.

— They are normally supplied with a hexagonal head adjustment screw. Upon request, they can be equipped with a SICBLOC adjustment knob on the main pressure control.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQM5-W	RQM7-W
Maximum operating pressure	bar	350	
Maximum flow rate	l/min	250	400
Ambient temperature range	°C	-20 / +50	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 ÷ 400	
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15		
Recommended viscosity	cSt	25	

NOTE: for the solenoid valve DS3 characteristics see catalogue 41 150

1 - IDENTIFICATION CODE

R	Q	M		-	W		/		/		/	60		-			K1	/	

Pressure relief valve pilot operated

solenoid valve for venting / pressure selection

Nominal dimension: **5** = ND 25
7 = ND 40

BSP threaded ports

Pressure adjustment range:
3 = up to 70 bar **6** = up to 350 bar
5 = up to 210 bar

Versions: **A**, **B**, **C**, **D**, **G** — see description in table 2 versions

M = adjustment with SICBLOC knob available on the main pressure control (omit for adjustment with hexagonal head screw)

Series No. (the overall and mounting dimensions remain unchanged from 60 to 69)

NOTE: The locking rings of the coils and the relevant O-Rings are supplied together with valves

Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

DC power supply
D12 = 12 V
D24 = 24 V
D48 = 48 V
D110 = 110 V
D220 = 220 V
D00 = valve without coils (see **NOTE**)

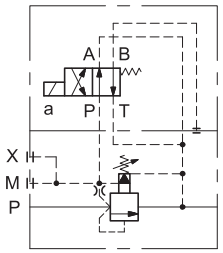
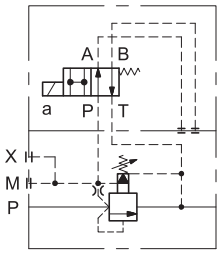
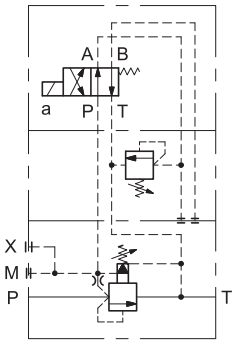
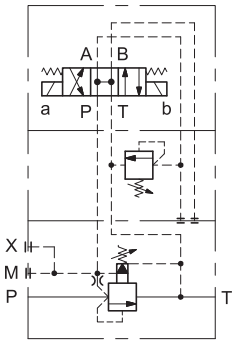
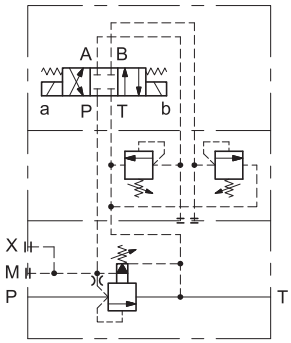
AC power supply
A24 = 24 V - 50 Hz
A48 = 48 V - 50 Hz
A110 = 110 V - 50 Hz / 120 V - 60 Hz
A230 = 230 V - 50 Hz / 240 V - 60 Hz
A00 = valve without coils (see **NOTE**)

F110 = 110 V - 60 Hz
F220 = 220 V - 60 Hz

Coil electrical connection: plug for connector type DIN 43650 (**standard**)

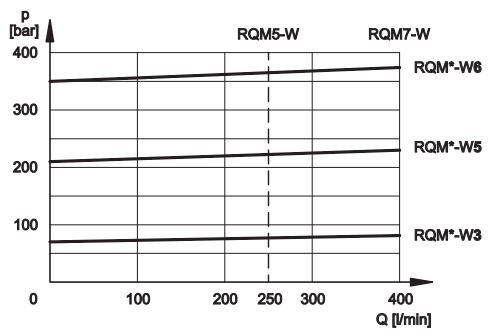
Manual override: omit for override integrated in the tube (**standard**)
CM = manual override, boot protected

2 - VERSIONS

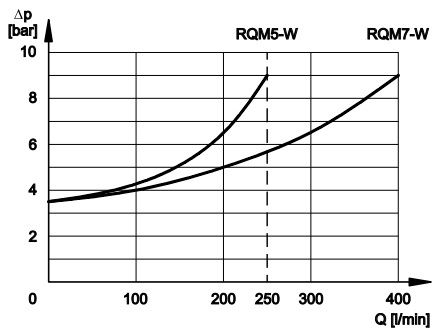
RQM*-W*/**A**	RQM*-W*/**B**	RQM*-W*/**C**	RQM*-W*/**D**	RQM*-W*/**G**
				
1 pressure setting and unloading with de-energized solenoid	**1 pressure setting and unloading with energized solenoid**	**2 pressure settings The highest setting is reached with energized solenoid**	**2 pressure settings and unloading with de-energized solenoids**	**3 pressure settings The highest setting is reached with de-energized solenoids**

3 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

ADJUSTMENT



MINIMUM CONTROLLED PRESSURE



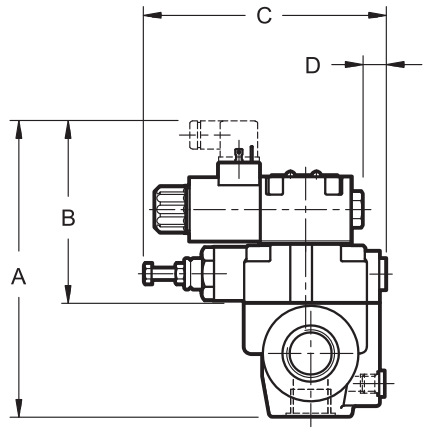
4 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.
The fluid must be preserved in its physical and chemical characteristics.

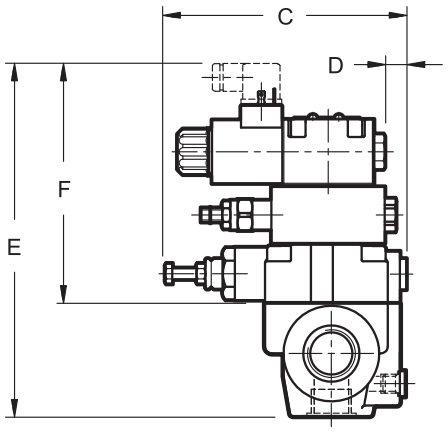
5 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

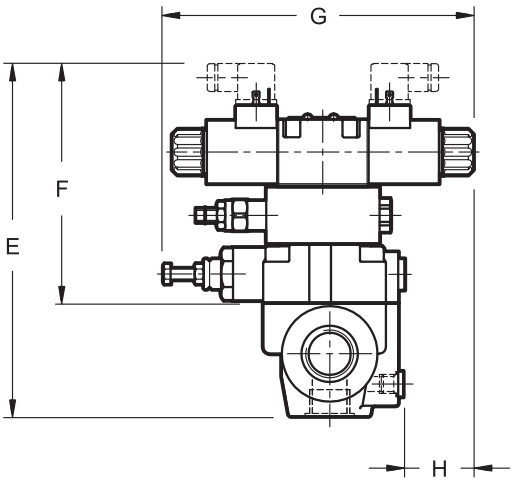
RQM*-W*/**A**
RQM*-W*/**B**



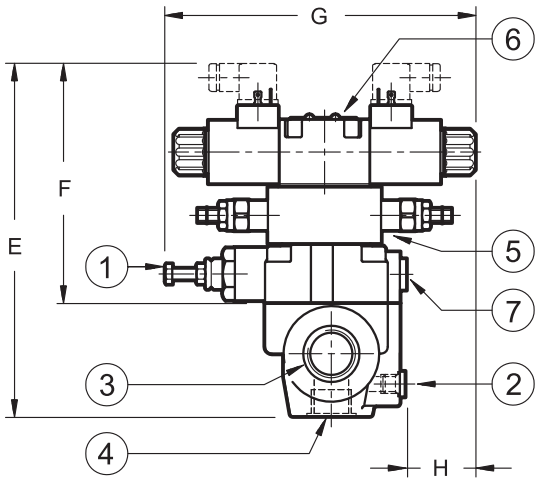
RQM*-W*/**C**



RQM*-W*/**D**



RQM*-W*/**G**



	A	B	C	D	E	F	G	H
RQM5-W	210	130	172	17	247	167	221.5	49.5
RQM7-W	232	130	172	17	269	167	221.5	49.5

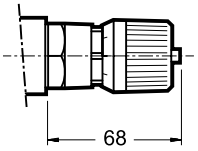
1	Hexagonal head main pressure adjustment screw: Spanner 13 Clockwise rotation to increase pressure
2	Remote piloting port X 1/4” BSP
3	Outlet port T **RQM5-W**: 1” BSP **RQM7-W**: 1” 1/2 BSP
4	Pressure port P **RQM5-W**: 3/4” BSP **RQM7-W**: 1” 1/4 BSP

5	Second value pressure adjustment valve. Countersunk hex adjustment screw: spanner 5 Clockwise rotation to increase pressure
6	ISO 4401-03 (CETOP 03) solenoid valve for pressure selection / unloading
7	Pressure gauge port 3/8” BSP

6 - ADJUSTMENT KNOB

The RQ valves can be equipped with a SICBLOC adjustment knob, only on the main pressure regulation. To operate it, push and rotate at the same time.

To request this option, add: /**M** (see paragraph 1).



7 - ELECTRIC CONNECTORS

The solenoid operated valves are delivered without the connectors. They must be ordered separately.
For the identification of the connector type to be ordered, please see catalogue 49 000.

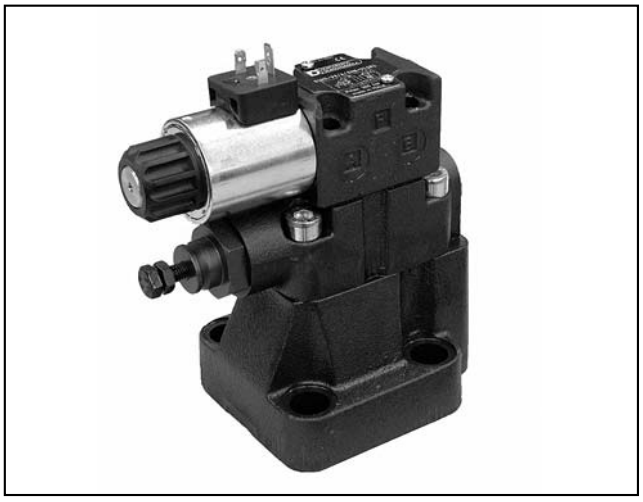
8 - MANUAL OVERRIDE, BOOT PROTECTED: CM

Whenever the solenoid valve installation may involve exposure to atmospheric agents or utilization in tropical climates, use of the manual override, boot protected, is recommended. Add the suffix **CM** to request this device (see paragraph1).

For overall dimensions see catalogue 41 150.

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com



RQM*-P

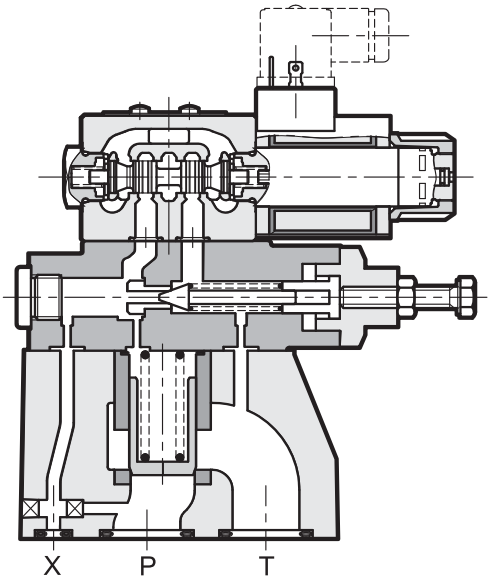
SOLENOID OPERATED PRESSURE RELIEF VALVES WITH UNLOADING AND PRESSURE SELECTION

SERIES 60

SUBPLATE MOUNTING

RQM3-P ISO 6264-06 (CETOP R06)
RQM5-P ISO 6264-08 (CETOP R08)
RQM7-P ISO 6264-10 (CETOP R10)

OPERATING PRINCIPLE



— The RQM*-P valves are pressure relief valves available in three nominal sizes for flow up to 500 l/min.

— They are available in ISO 6264 (CETOP RP 121H) subplate mounting version.

— Available in five versions that allow, by means of a solenoid valve, unloading of the total flow and selection up to three pressure values (see table 2 Versions).

— The adjustment of the second and third pressure values is obtained by a pressure relief valve placed between the main stage and the solenoid valve.

— It is supplied with an hexagonal head adjustment screw. Upon request, it can be equipped with a SICBLOC adjustment knob on the main pressure control.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQM3-P	RQM5-P	RQM7-P
Maximum operating pressure	bar	350		
Maximum flow rate	l/min	200	400	500
Ambient temperature range	°C	-20 / +50		
Fluid temperature range	°C	-20 / +80		
Fluid viscosity range	cSt	10 ÷ 400		
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15			
Recommended viscosity	cSt	25		

NOTE: for the solenoid valve DS3 characteristics see catalogue 41 150

1 - IDENTIFICATION CODE

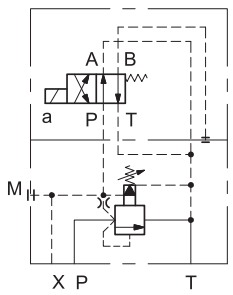
R Q M - P / / / / 60 - K1 /

- pilot operated pressure relief valve
- solenoid valve for unloading / pressure selection
- Size: **3** = ISO 6264-06 (CETOP R06); **5** = ISO 6264-08 (CETOP R08); **7** = ISO 6264-10 (CETOP R10)
- Subplate mounting
- Pressure adjustment range: **3** = up to 70 bar; **5** = up to 210 bar; **6** = up to 350 bar
- Versions: **A**, **B**, **C**, **D**, **G** — see description in hydraulic symbols table
- **M** = adjustment with SICBLOC knob available only on the main pressure control (Omit for adjustment with hexagonal head screw)
- Series No. (the overall and mounting dimensions remain unchanged from 60 to 69)
- Seals: **N** = NBR seals for mineral oil (**standard**); **V** = FPM seals for special fluids
- DC power supply: **D12** = 12 V; **D24** = 24 V; **D48** = 48 V; **D110** = 110 V; **D220** = 220 V; **D00** = valve without coils (see note)
- AC power supply: **A24** = 24 V - 50 Hz; **A48** = 48 V - 50 Hz; **A110** = 110 V - 50 Hz / 120 V - 60 Hz; **A230** = 230 V - 50 Hz / 240 V - 60 Hz; **A00** = valve without coils (see note)
- **F110** = 110 V - 60 Hz; **F220** = 220 V - 60 Hz
- Coil electrical connection: plug for connector type DIN 43650 (**standard**)
- Manual override: omit for override integrated in the tube (**standard**); **CM** = manual override, boot protected

NOTE: The locking rings of the coils and the relevant O-Rings are supplied together with valves

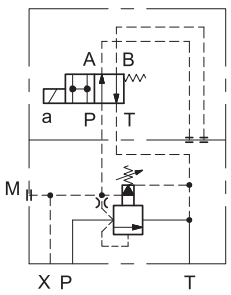
2 - VERSIONS

RQM*-P*/**A**



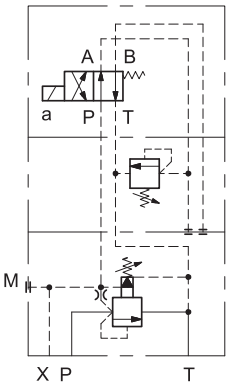
1 pressure setting and unloading with de-energized solenoid

RQM*-P*/**B**



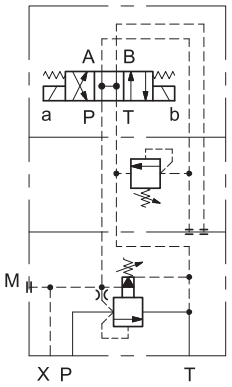
1 pressure setting and unloading with energized solenoid

RQM*-P*/**C**



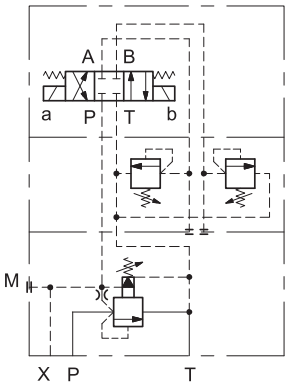
2 pressure settings The highest setting is reached with energized solenoid

RQM*-P*/**D**



2 pressure settings and unloading with de-energized solenoids

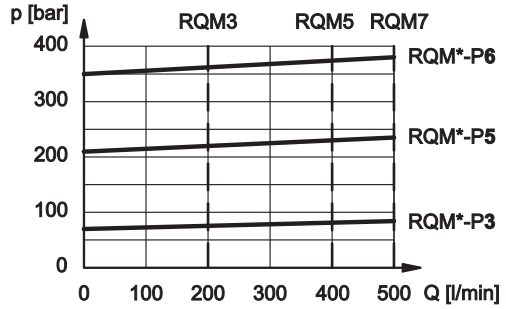
RQM*-P*/**G**



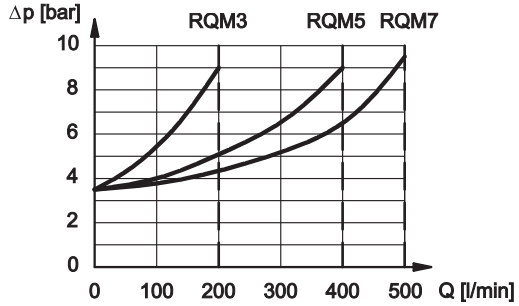
3 pressure settings The highest setting is reached with de-energized solenoids

3 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

ADJUSTMENT



MINIMUM CONTROLLED PRESSURE

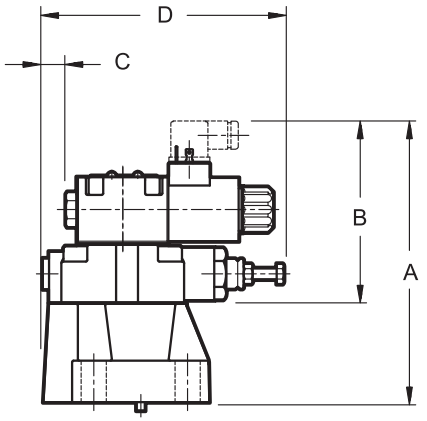


4 - HYDRAULIC FLUIDS

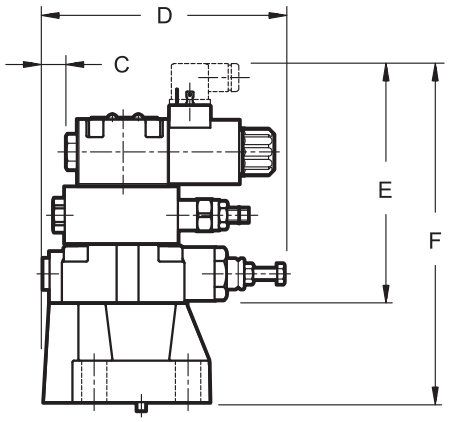
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.
The fluid must be preserved in its physical and chemical characteristics.

5 - OVERALL AND MOUNTING DIMENSIONS

RQM*-P/**A**
RQM*-P/**B**

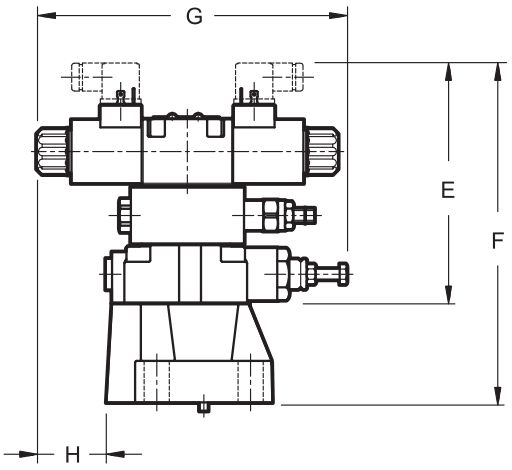


RQM*-P/**C**

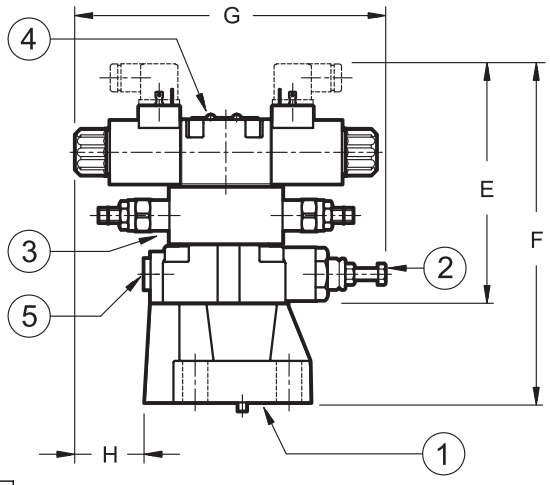


dimensions in mm

RQM*-P/**D**



RQM*-P/**G**

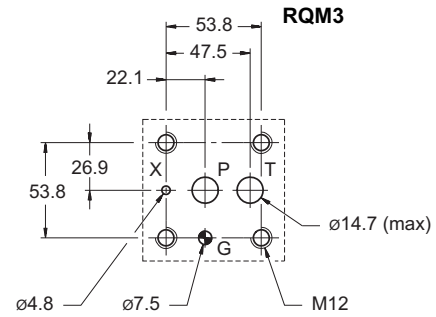


1	Mounting surface For fastening bolts and sealing rings see paragraph 10
2	Hexagonal head main pressure adjustment screw: Spanner 13 Clockwise rotation to increase pressure
3	Second value pressure adjustment valve. Countersunk hex adjustment screw: Spanner 5 Clockwise rotation to increase pressure

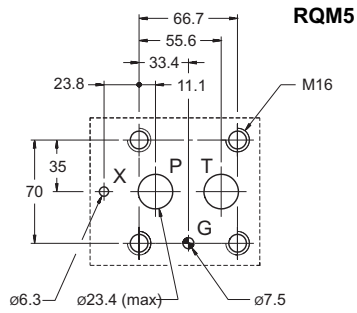
4	ISO 4401-03 (CETOP 03) solenoid valve for pressure selection / unloading
5	Pressure gauge port 3/8” BSP

	A	B	C	D	E	F	G	H
RQM3-P	186	126	22	179	164	226	223	44
RQM5-P	196	126	14	170	164	236	222	52
RQM7-P	206	126	25	180	164	246	221	41

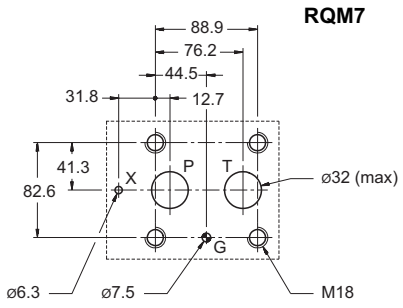
6 - MOUNTING SURFACES



ISO 6264-06-09-*-97 (CETOP 4.4.2-2-R06-350)



ISO 6264-08-13-*-97 (CETOP 4.4.2-2-R08-350)

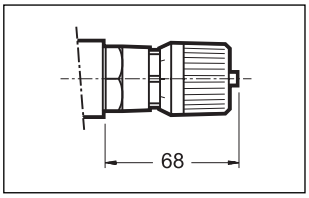


ISO 6264-10-17-*-97 (CETOP 4.4.2-2-R10-350)

7 - ADJUSTMENT KNOB

The valves can be equipped with a SICBLOC adjustment knob, only on the main pressure regulation. To operate it, push and rotate at the same time.

To request this option, add: **/M** (see paragraph 1).



8 - ELECTRIC CONNECTORS

The solenoid valves are never supplied with connector. Connectors must be ordered separately. For the identification of the connector type to be ordered, please see catalogue 49 000.

9 - MANUAL OVERRIDE, BOOT PROTECTED: CM

Whenever the solenoid valve installation may involve exposure to atmospheric agents or utilization in tropical climates, use of the manual override boot protected is recommended.

Add the suffix **CM** to request this device (see paragraph 1). For overall dimensions see catalogue 41 150.

10 - FASTENING BOLTS AND SEALING RINGS

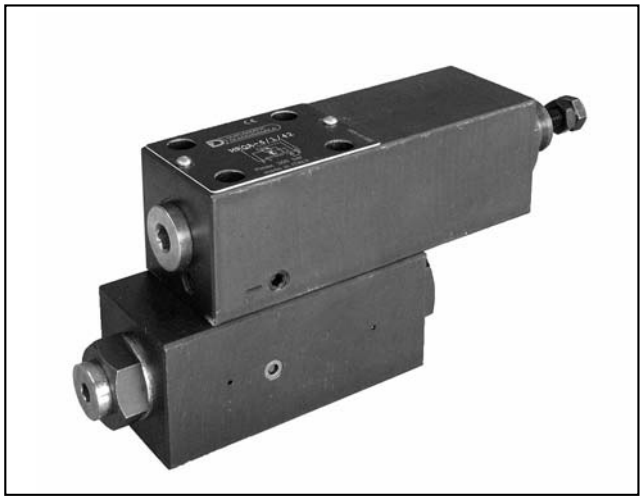
	RQM3-P	RQM5-P	RQM7-P
Fastening (4 SHC bolts ISO 4762)	M12 x 40	M16 x 50	M18 x 60
Torque	69 Nm	170 Nm	235 Nm
Sealing rings	N. 2 OR type 123 (17.86x2.62) 90 Shore N. 1 OR type 109 (9.13x2.62) 90 Shore	N. 2 OR type 3118 (29.82x2.62) 90 Shore N. 1 OR type 109 (9.13x2.62) 90 Shore	N. 2 OR type 4137 (34.52x3.53) 90 Shore N. 1 OR type 109 (9.13x2.62) 90 Shore

11 - SUBPLATES (see catalogue 51 000)

	RQM3-P	RQM5-P	RQR7-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports
P, T, U ports dimension	P: 1/2" BSP T: 3/4" BSP	1" BSP	1" 1/4 BSP
X port dimension	1/4" BSP	1/4" BSP	1/4" BSP

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com



MRQA

UNLOADING VALVE

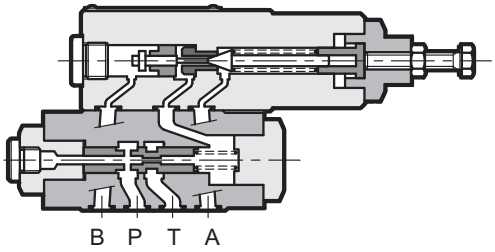
(FOR CIRCUITS WITH ACCUMULATOR)

SERIES 42

SUBPLATE MOUNTING
ISO 4401-03 (CETOP 03)

p max **350** bar
Q max **40** l/min

OPERATING PRINCIPLE



— MRQA is a pressure relief and safety valve with automatic unloading. Upon reaching the set value, the valve freely unloads the pump and puts it under pressure again when the pressure values descend in the circuit to correspond to 68% or 78% of the set value.

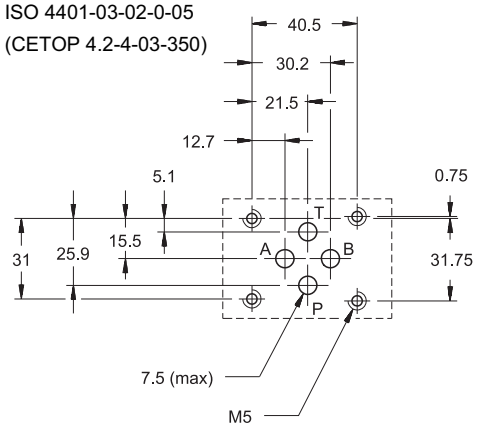
In order to assure this operation, it is necessary to use an accumulator (see hydraulic diagram) that guarantees pressure maintenance in the circuit. A check valve, incorporated in the panel or available as a plate under the valve MRQA/C, prevents the accumulator unloading through the open valve.

This system maintains the pressure in the hydraulic circuit, avoiding heating of the oil and reducing energy consumption.

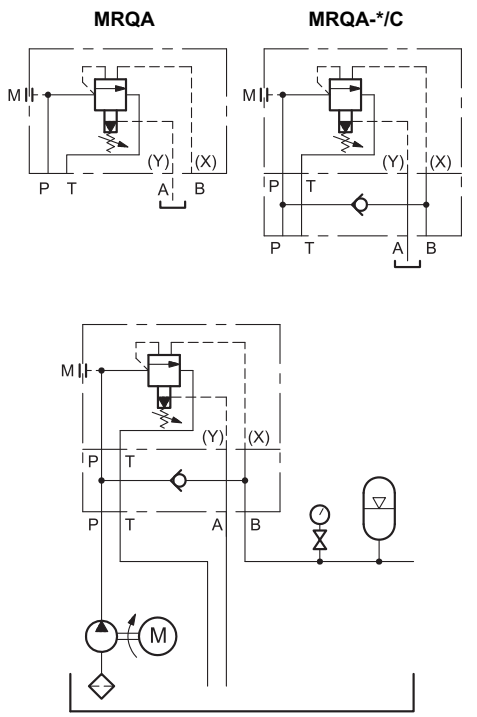
It is recommended to place the accumulator as close as possible to the MRQA, without reducing the connection size.

— The cycle time depends on the pump flow rate, the accumulator capacity and pre-charge, and the flow requirement of the system.

MOUNTING INTERFACE



HYDRAULIC SYMBOLS & DIAGRAM



PERFORMANCE RATINGS (measured with mineral oil of viscosity 36 cSt at 50°C)

Maximum operating pressure	bar	350
Maximum flow rate	l/min	40
Ambient temperature range	°C	-20 / +50
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 21/19/16	
Recommended viscosity	cSt	25
Mass: MRQA MRQA*/C	kg	3,3 4,2

1 - IDENTIFICATION CODE

M	R	Q	A	-		/		/		/		/	42	/	

Size ISO 4401-03 (CETOP 03)

Unloading valve

Automatic unloading for circuits with accumulator

Pressure adjustment range:
3 = 25 ÷ 70 bar
5 = 50 ÷ 210 bar
6 = 100 ÷ 320 bar

Differential pressure (values ± 2.5%)
1 = pump switch on at 78% of adjustment value
2 = pump switch on at 68% of adjustment value

M = Adjustment with SICBLOC knob (omit for adjustment with hexagonal head screw)

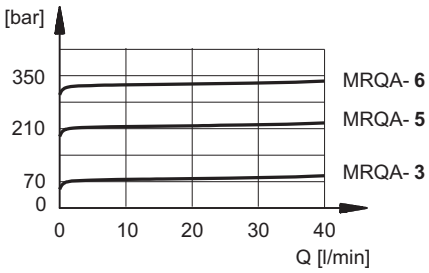
C = Check valve (omit if not required)

Series No. (the overall and mounting dimensions remain unchanged from 40 to 49)

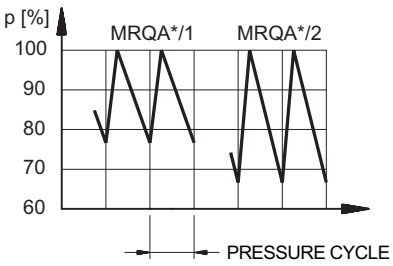
Seals: omit for mineral oils
V = viton for special fluids

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

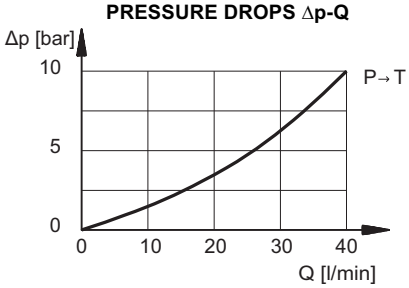
ADJUSTMENT



RESETTING PRESSURES



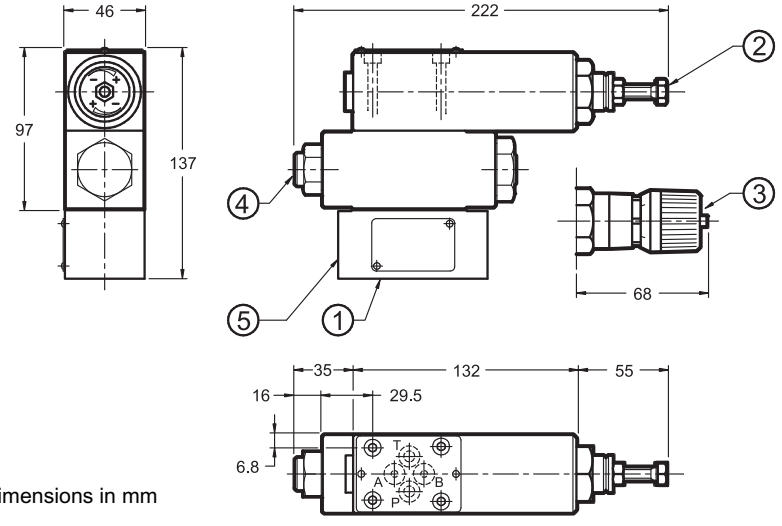
PRESSURE DROPS Δp-Q



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.
The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS



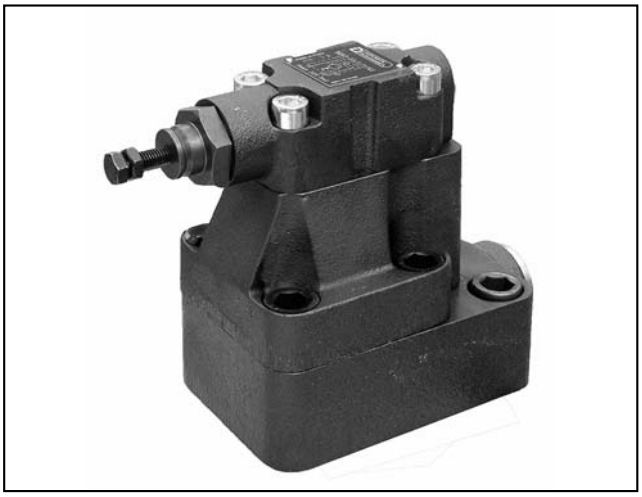
dimensions in mm

FASTENING SCREWS:
MRQA
4 SHC screws ISO 4762 M5x95
MRQA/C
4 SHC screws ISO 4762 M5x135
Tightening torque: 5 Nm

1	Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) - 90 Shore
2	Hexagonal head adjustment screw. Spanner 13. Clockwise rotation to increase pressure
3	SICBLOC adjustment knob. To operate, push and rotate at the same time.
4	Pressure gauge port 1/4" BSP
5	Check valve for version /C

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com



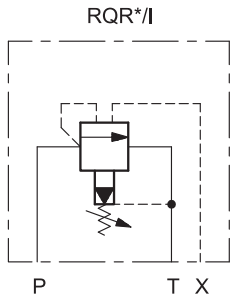
RQ**-P
UNLOADING VALVE
(FOR CIRCUITS WITH ACCUMULATOR)
SERIES 42

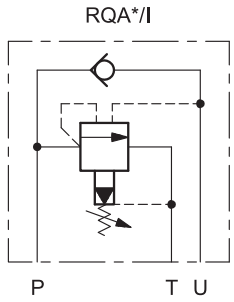
RQR*-P
FOR REMOTE PILOTING

RQA*-P
WITH INCORPORATED CHECK VALVE

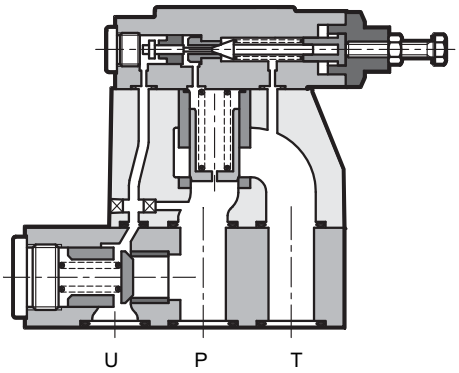
SUBPLATE MOUNTING

HYDRAULIC SYMBOLS





OPERATING PRINCIPLE



— The RQR*-P and RQR*-A valves have not only the normal function of relief valves or safety valves but also the characteristic of freely discharging the pump flow when the set pressure value is reached.

In order to assure this condition, the use of an accumulator that guarantees pressure in the circuit is required. The use of a check valve prevents the accumulator from discharging through the valve in the open position.

— Those valves are made with a balanced shutter main stage that has wide passages for big flows and reduced pressure drops.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQR3-P	RQR5-P	RQR7-P	RQA5-P	RQA7-P
Maximum operating pressure	bar	350				
Maximum flow rate	l/min	200	400	500	400	500
Ambient temperature range	°C	-20 / +50				
Fluid temperature range	°C	-20 / +80				
Fluid viscosity range	cSt	10 ÷ 400				
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15					
Recommended viscosity	cSt	25				
Mass	Kg	3,5	4,3	6,5	10	17

1 - IDENTIFICATION CODE

R Q | | - P | | / | | / I / | | / 42 / |

Unloading valve

Automated unloading
for circuits with accumulator
R = for remote piloting
A = with incorporated
check valve (size 3 excluded)

Size:
3 = RQR3-P ISO 6264-06-09-*-97 (CETOP R06)
5 = RQR5-P ISO 6264-08-13-*-97 (CETOP R08)
5 = RQA5-P
7 = RQR7-P ISO 6264-10-07-*-97 (CETOP R10)
7 = RQA7-P

Subplate mounting

Pressure adjustment range:
3 = up to 70 bar
5 = up to 210 bar
6 = up to 350 bar

1 = pump switch on at 85% of the set value
2 = pump switch on at 70% of the set value

Internal drainage.

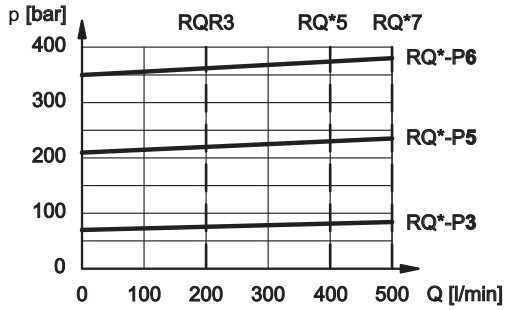
M = adjustment with SICBLOC knob
(omit for adjustment with hexagonal
head screw)

Series No.
(the overall and mounting
dimensions remain
unchanged from 40 to 49)

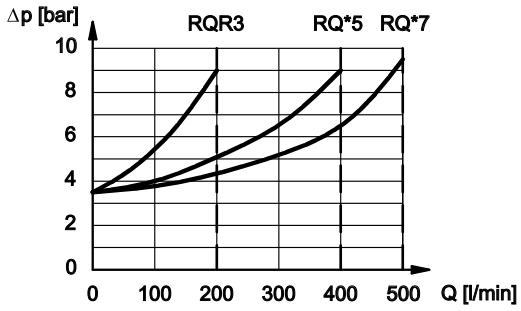
Seals: omit for
mineral oils
V = viton for
special fluids

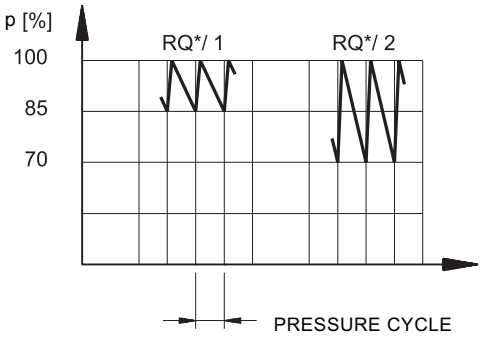
2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

ADJUSTMENT



MINIMUM CONTROLLED PRESSURE



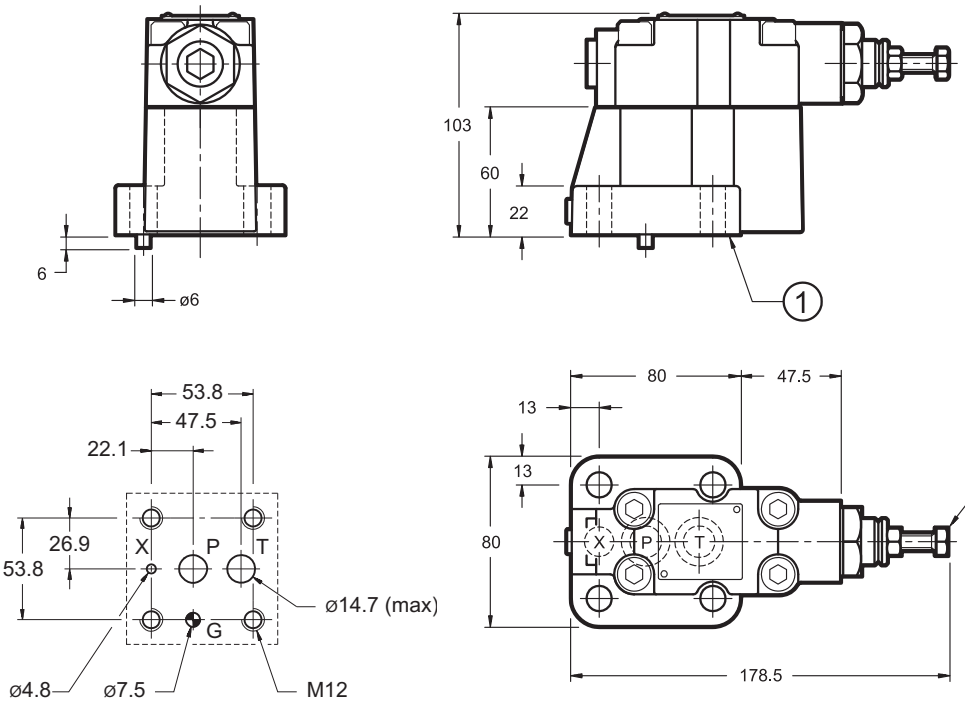


3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.
The fluid must be preserved in its physical and chemical characteristics.

4 - RQR3-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



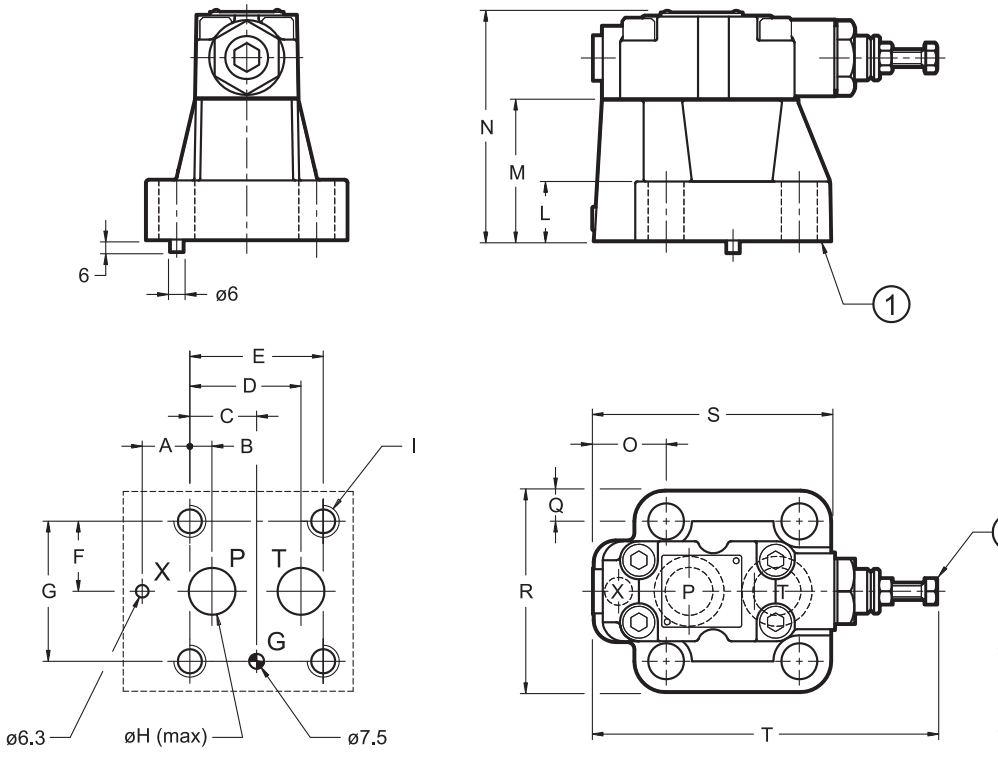
1	Mounting surface with sealing rings: N. 2 OR type 123 (17.86x2.62) N. 1 OR type 109 (9.13x2.62) 90 Shore
2	Hexagonal head adjustment screw. Spanner 13. Clockwise rotation to increase pressure.

FASTENING BOLTS (included):
4 SHC bolts ISO 4762 M12x40
Tightening torque: 69 Nm

MOUNTING SURFACE: ISO 6264-06-09-*-97 (CETOP 4.4.2-2-R06-350)

5 - RQR5-P and RQR7-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



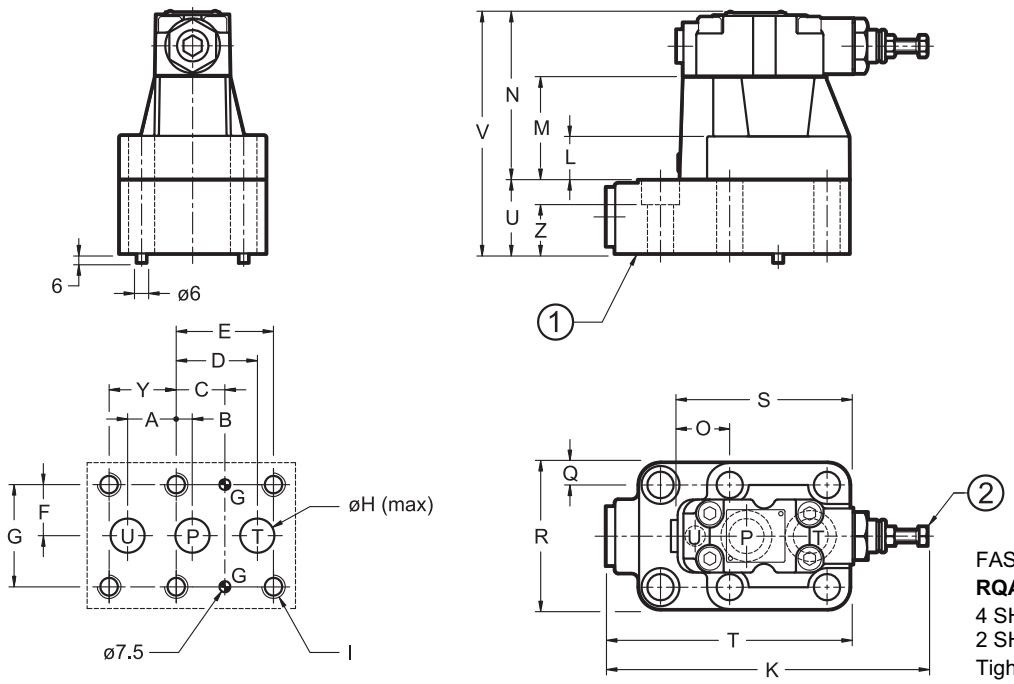
1	Mounting surface with sealing rings: **RQR5** N. 2 OR type 3118 (29.82x2.62) N. 1 OR type 109 (9.13x2.62) - 90 Shore **RQR7** N. 2 OR type 4137 (34.52x3.53) N. 1 OR type 109 (9.13x2.62) - 90 Shore
2	Hexagonal head adjustment screw. Spanner 13.

FASTENING BOLTS (included):
RQR5
4 SHC bolts ISO 4762 M16x50
Tightening torque: 170 Nm
RQR7
4 SHC bolts ISO 4762 M18x60
Tightening torque: 235 Nm

	MOUNTING SURFACE	A	B	C	D	E	F	G	ØH	I	L	M	N	O	Q	R	S	T
RQR5-P	ISO 6264-08-13-*-97 (CETOP 4.4.2-2-R08-350)	23.8	11.1	33.4	55.6	66.7	35	70	23.4	M16	27	70	113	35.8	15	100	118	170
RQR7-P	ISO 6264-10-17-*-97 (CETOP 4.4.2-2-R10-350)	31.8	12.7	44.5	76.2	88.9	41.3	82.6	32	M18	35	80	123	44.1	18.7	120	152	180

6 - RQA5-P and RQA7P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



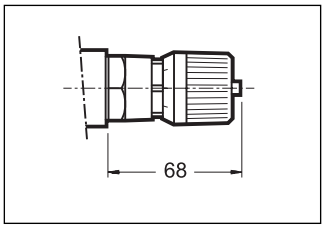
1	Mounting surface with sealing rings: **RQA5** N. 3 OR type 3118 (29.82x2.62) 90 Shore **RQR7** N. 2 OR type 4137 (34.52x3.53) 90 Shore
2	Hexagonal head adjustment screw. Spanner 13.

FASTENING BOLTS (included):
RQA5
4 SHC bolts ISO 4762 M16x100
2 SHC bolts ISO 4762 M16x55
Tightening torque:170 Nm
RQA7
4 SHC bolts ISO 4762 M18x130
2 SHC bolts ISO 4762 M18x70
Tightening torque: 235 Nm

	A	B	C	D	E	F	G	ØH	I	K	L	M	N	O	Q	R	S	T	U	V	Y	Z
RQA5-P	33.3	11.1	33.4	55.6	66.7	35	70	23.4	M16	213	27	70	113	35.8	15	100	118	167	50	163	46	33.5
RQA7-P	38	12.7	44.5	76.2	88.9	41.3	82.6	32	M18	245	35	80	123	44.1	18.7	120	152	222	66	189	50.8	48

7 - ADJUSTMENT KNOB

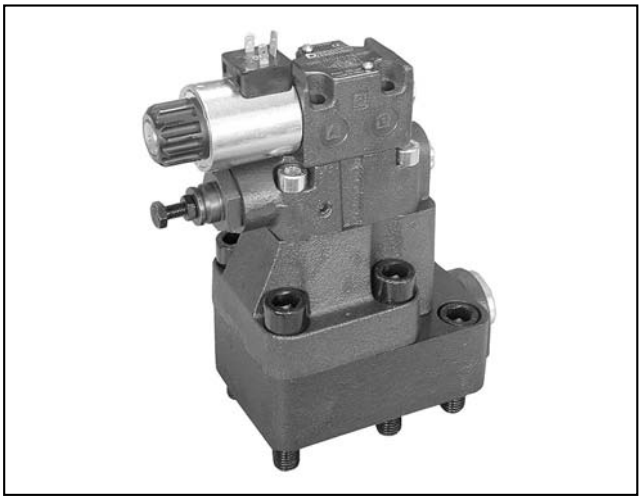
The valves can be equipped with a SICBLOC adjustment knob. To operate it, push and rotate at the same time.
To request this option, add: /**M** (see paragraph1).



8 - SUBPLATES (see catalogue 51 000)

	RQR3-P	RQR5-P	RQR7-P	RQA5-P	RQA7-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports	PMRQA5-AI5G rear ports	PMRQA7-AI7G rear ports
P, T, U ports dimensions	P: 1/2" BSP T: 3/4" BSP	1" BSP	1" 1/4 BSP	3/4" BSP	1" 1/4 BSP
X port dimension	1/4" BSP	1/4" BSP	1/4" BSP	-	-

DUPLOMATIC OLEODINAMICA
DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com



RQ*M*-P

UNLOADING VALVE WITH AUTOMATIC OR SOLENOID OPERATED VENTING

(FOR CIRCUITS WITH ACCUMULATOR)

SERIES 51

RQRM*-P

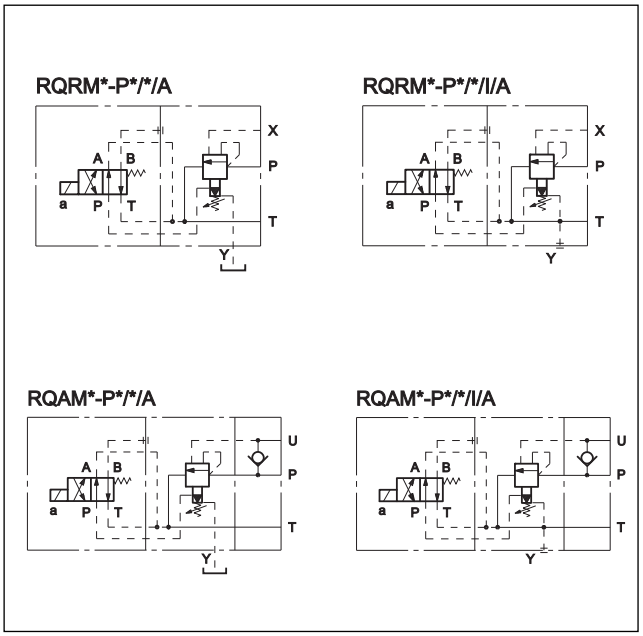
FOR REMOTE PILOTING

RQAM*-P

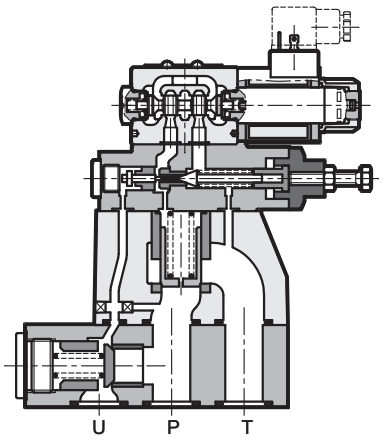
WITH INCORPORATED CHECK VALVE

SUBPLATE MOUNTING

HYDRAULIC SYMBOLS



OPERATING PRINCIPLE



— The RQ*M*-P valves have not only the normal function of relief valves or safety valves but also the characteristic of freely discharging the pump flow either when the set pressure value is reached, or when the solenoid valve is de-energized. In order to assure this condition, the use of an accumulator that guarantees pressure in the circuit is required. The use of a check valve prevents the accumulator from discharging through the valve in the open position.

— They are made with a balanced shutter main stage that has wide passages for large flows, with reduced pressure drops.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQRM3-P	RQRM5-P	RQRM7-P	RQAM5-P	RQAM7-P
Maximum operating pressure	bar	350				
Maximum flow rate	l/min	200	400	500	400	500
Ambient temperature range	°C	-20 / +50				
Fluid temperature range	°C	-20 / +80				
Fluid viscosity range	cSt	10 ÷ 400				
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15					
Recommended viscosity	cSt	25				
Mass	Kg	5	5,8	8	12	19

NOTE: for the solenoid valve DS3 characteristics see catalogue 41 150

1 - IDENTIFICATION CODE

R Q | | M | | - P | | / | | / A / | | / | | / 51 | | - | | K1 / |

Unloading valve

Automatic venting for circuits with accumulator
R = for remote piloting
A = with embedded check valve (unavailable on size 3)

Solenoid valve for electrical unloading

Size:
3 = (RQRM3-P) ISO 6264-06-09-*-97 (CETOP R06)
5 = (RQRM5-P) ISO 6264-08-13-*-97 (CETOP R08)
5 = (RQAM5-P)
7 = (RQRM7-P) ISO 6264-10-17-*-97 (CETOP R10)
7 = (RQAM7-P)

Subplate mounting

Pressure adjustment range:
3 = up to 70 bar **6** = up to 350 bar
5 = up to 210 bar

1 = pump switch on at 85% of the set value
2 = pump switch on at 70% of the set value

Unloading with de-energized solenoid

I = internal drainage (not possible when the backpressure on the return line is greater than 2 bar). Omit for external drainage.

CM = manual override, boot protected.
Omit for override integrated in the tube (**standard**)

Coil electrical connection: plug for connector type DIN 43650 (**standard**)

DC power supply
D12 = 12 V
D24 = 24 V
D48 = 48 V
D110 = 110 V
D220 = 220 V
D00 = valve without coils (see **NOTE**)

AC power supply
A24 = 24 V - 50 Hz
A48 = 48 V - 50 Hz
A110 = 110 V - 50 Hz / 120 V - 60 Hz
A230 = 230 V - 50 Hz / 240 V - 60 Hz
A00 = valve without coils (see **NOTE**)
F110 = 110 V - 60 Hz
F220 = 220 V - 60 Hz

Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

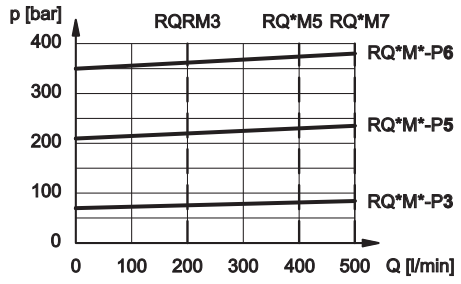
Series No. (the overall and mounting dimensions remain unchanged from 50 to 59)

M = adjustment with SICBLOC knob (omit for adjustment with hexagonal head screw)

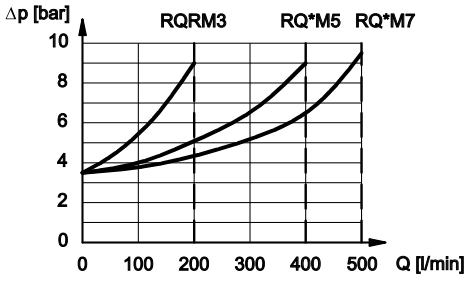
NOTE: The locking rings of the coils and the relevant O-Rings are supplied together with valves

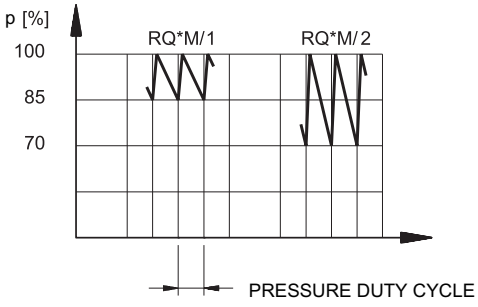
2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

ADJUSTMENT



MINIMUM CONTROLLED PRESSURE





3 - HYDRAULIC FLUIDS

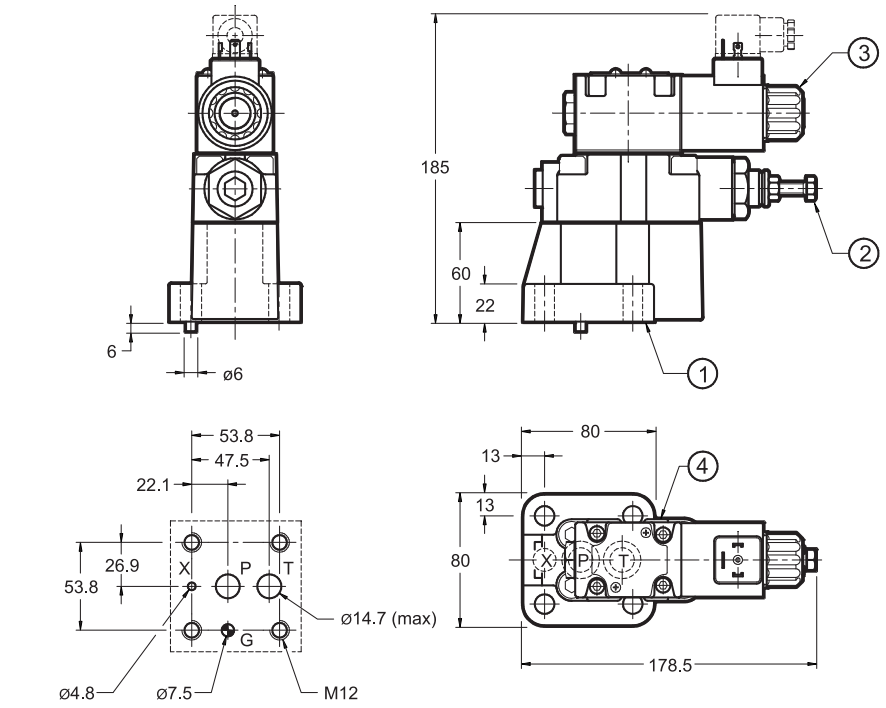
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - RQRM3-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



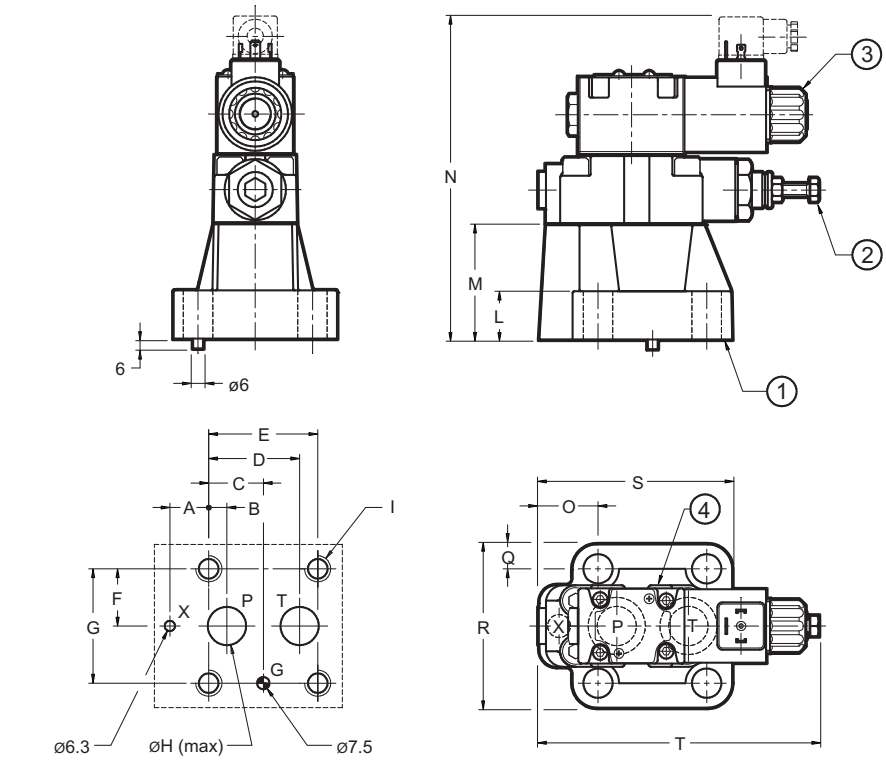
1	Mounting surface with sealing rings: N. 2 OR type 123 (17.86x2.62) 90 Shore N. 1 OR type 109 (9.13x2.62) 90 Shore
2	Hexagonal head main pressure adjustment screw. Spanner 13. Clockwise rotation to increase pressure.
3	ISO 4401-03 (CETOP 03) solenoid valve for unloading
4	External drainage port Y 1/8" NPT

MOUNTING INTERFACE: ISO 6264-06-09-*-97 (CETOP 4.4.2-2-R06-350)

FASTENING BOLTS:
4 bolts M12x40 Torque: 69 Nm

5 - RQRM5-P and RQRM7-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



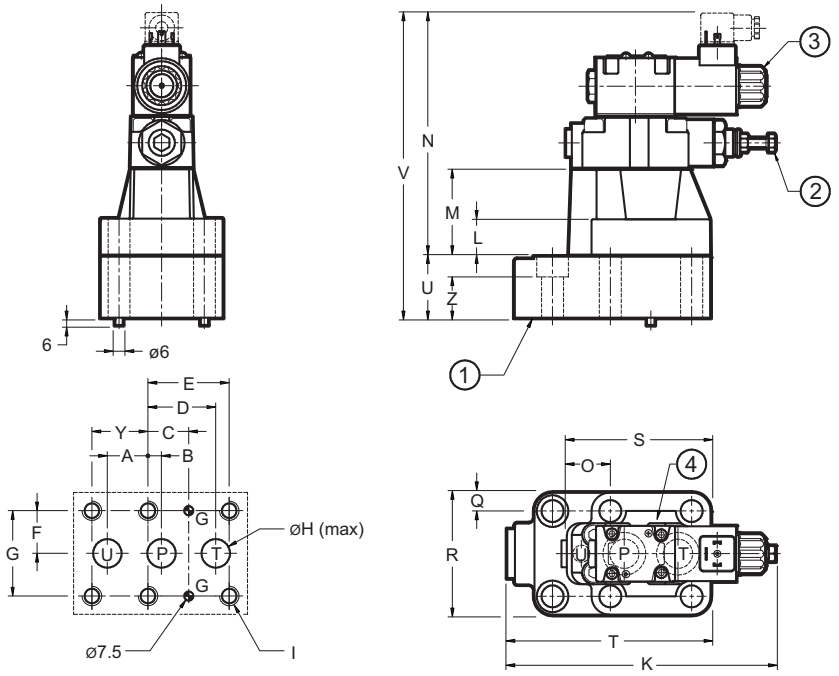
1	Mounting surface with sealing rings: **RQRM5** N. 2 OR type 3118 (29.82x2.62) - 90 Shore N. 1 OR type 109 (9.13x2.62) - 90 Shore **RQRM7** N. 2 OR type 4137 (34.52x3.53) - 90 Shore N. 1 OR type 109 (9.13x2.62) - 90 Shore
2	Hexagonal head main pressure adjustment screw. Spanner 13. Clockwise rotation to increase pressure.
3	ISO 4401-03 (CETOP 03) solenoid valve for unloading
4	External drainage port Y 1/8" NPT

FASTENING BOLTS:
RQRM5
4 bolts M16x50 Torque: 170 Nm
RQRM7
4 bolts M18x60 Torque: 235 Nm

	MOUNTING INTERFACE	A	B	C	D	E	F	G	ØH	I	L	M	N	O	Q	R	S	T
RQRM5-P	ISO 6264-08-13-*-97 (CETOP 4.4.2-2-R08-350)	23.8	11.1	33.4	55.6	66.7	35	70	23.4	M16	27	70	194	35.8	15	100	118	170
RQRM7-P	ISO 6264-10-17-*-97 (CETOP 4.4.2-2-R10-350)	31.8	12.7	44.5	76.2	88.9	41.3	82.6	32	M18	35	80	204	44.1	18.7	120	152	180

6 - RQAM5-P and RQAM7-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



1	Mounting surface with sealing rings: **RQAM5** N. 2 OR type 3118 (29.82x2.62) - 90 Shore **RQAM7** N. 2 OR type 4137 (34.52x3.53) - 90 Shore
2	Hexagonal head main pressure adjustment screw. Spanner 13. Clockwise rotation to increase pressure.
3	ISO 4401-03 (CETOP 03) solenoid valve for unloading
4	External drainage port Y 1/8" NPT

FASTENING BOLTS:

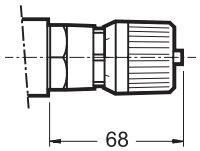
RQAM5
4 bolts M16x100
2 bolts M16x55
Torque:170 Nm

RQAM7
4 bolts M18x130
2 bolts M18x70
Torque: 235 Nm

	A	B	C	D	E	F	G	ØH	I	K	L	M	N	O	Q	R	S	T	U	V	Y	Z
RQAM5-P	33.3	11.1	33.4	55.6	66.7	35	70	23.4	M16	212	27	70	194	35.8	15	100	118	160	50	244	46	33.5
RQAM7-P	38	12.7	44.5	76.2	88.9	41.3	82.6	32	M18	242	35	80	204	44.1	18.7	120	152	218	66	270	50.8	48

7 - ADJUSTMENT KNOB

The RQ*M*-P valves can be equipped with a SICBLOC adjustment knob.
To operate it, push and rotate at the same time. To request this option, add: /**M** (see paragraph 1).



8 - ELECTRIC CONNECTORS

The solenoid valves are never supplied with connector.Connectors must be ordered separately.
For the identification of the connector type to be ordered, please see catalogue 49 000.

9 - MANUAL OVERRIDE, BOOT PROTECTED: CM

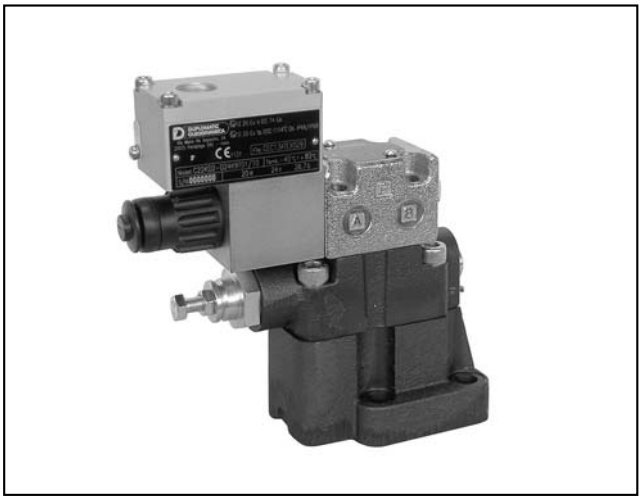
Whenever the solenoid valve installation may involve exposure to atmospheric agents or utilization in tropical climates, use of the manual override, boot protected is recommended. Add the suffix **CM** to request this device (see paragraph 1).
For overall dimensions see catalogue 41 150.

10 - SUBPLATES (see catalogue 51 000)

	RQRM3-P	RQRM5-P	RQRM7-P	RQAM5-P	RQAM7-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports	PMRQA5-AI5G rear ports	PMRQA7-AI7G rear ports
P T U port dimensions	1/2" BSP	1" BSP	1" 1/4 BSP	3/4" BSP	1" 1/4 BSP
X port dimensions	1/4" BSP	1/4" BSP	1/4" BSP	_	_

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com



RQM*KD2-P

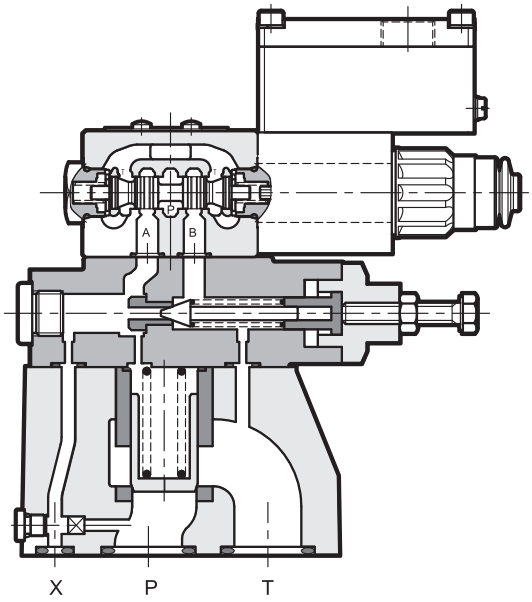
EXPLOSION-PROOF SOLENOID OPERATED PRESSURE RELIEF VALVES WITH UNLOADING AND PRESSURE SELECTION in compliance with ATEX 94/9/EC

SERIES 10

SUBPLATE MOUNTING

RQM3KD2-P ISO 6264-06 (CETOP R06)
RQM5KD2-P ISO 6264-08 (CETOP R08)
RQM7KD2-P ISO 6264-10 (CETOP R10)

OPERATING PRINCIPLE



TYPE EXAMINATION CERTIFICATE No.: 1131-CEC 13 ATEX 030

— The RQM*KD2-P valves are explosion-proof pressure relief valves, available in ISO 6264 (CETOP RP 121H) subplate mounting version with three nominal sizes for flow up to 500 l/min.

— These valves are ATEX 94/9/EC standards certified and are suitable for the use in potentially explosive atmospheres, that fall within either the ATEX II 2GD for gas or for dust classification. See par. 5 for ATEX classification, operating temperatures and electrical characteristics.

— They are available in five versions that allow the unloading of the total flow and selection up to three pressure values (see table 2 Versions) by means of a solenoid valve.

— They are supplied with a hexagonal head adjustment screw. Upon request, it can be equipped with a SICBLOC adjustment knob on the main pressure control.

— The adjustment of the second and third pressure values is obtained by a pressure relief valve placed between the main stage and the solenoid valve.

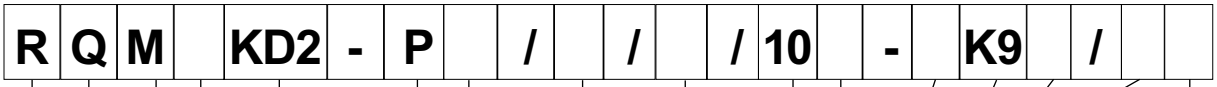
— The declaration of conformity to the up mentioned standards is always supplied with the valve.

— The valve is supplied with stardard surface treatment of phosphating black for the main body and zinc-nickel for the pilot body. Upon request we can supply these valves completely with zinc-nickel surface treatment, suitable to ensure a salt spray resistance up to 600 h (test operated according to UNI EN ISO 9227 standards and test evaluation operated according to UNI EN ISO 10289 standards).

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQM3KD2-P	RQM5KD2-P	RQM7KD2-P
Maximum operating pressure	bar	350		
Maximum flow rate	l/min	200	400	500
Ambient temperature range	°C	-20 / +80 (NBR and FPM) -40 / +80 (NL)		
Fluid temperature range	°C	-20 / +80 (NBR and FPM) -40 / +80 (NL)		
Fluid viscosity range	cSt	10 ÷ 400		
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15			
Recommended viscosity	cSt	25		

1 - IDENTIFICATION CODE



Pilot operated pressure relief valve

Solenoid valve for unloading / pressure selection

Size:
3 = ISO 6264-06 (CETOP R06)
5 = ISO 6264-08 (CETOP R08)
7 = ISO 6264-10 (CETOP R10)

Explosion-proof version, according to ATEX - II 2GD for gas or for dust (protection type of the coil: “d”)

Subplate mounting

Pressure adjustment range:
3 = up to 70 bar **5** = up to 210 bar **6** = up to 350 bar

Versions: **A** **B** **C** **D** **G** see description in the table 2 - versions

M = adjustment with SICBLOC knob available only on the main pressure control (Omit for adjustment with hexagonal head screw)

Series No. (the overall and mounting dimensions remain unchanged from 10 to 19)

Seals:

For temperature range -20 / +80 °C
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

For temperature range -40 / +80 °C
NL = seal for low temperatures (for mineral oil)

Power supply:

Continuous current (DC)
D12 = 12 V
D24 = 24 V
D48 = 48 V
D110 = 110 V

Rectified current (RAC)
R120 = 120 V
R240 = 240 V

Coil electrical connection:
electrical connection by terminal block

Connection type for cable gland

Available for upper connection:
T01 = M20x1.5 - ISO 261
T02 = Gk 1/2 - UNI EN 10226-2
T03 = 1/2” NPT - ANSI B1.20.1 (ex ANSI B2.1)

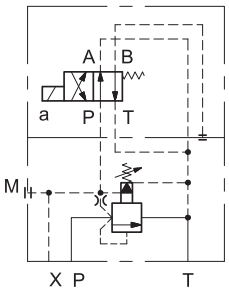
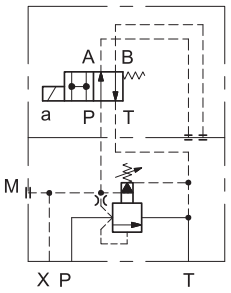
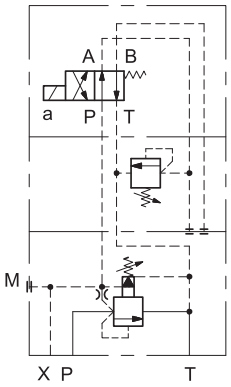
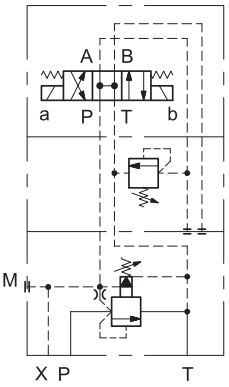
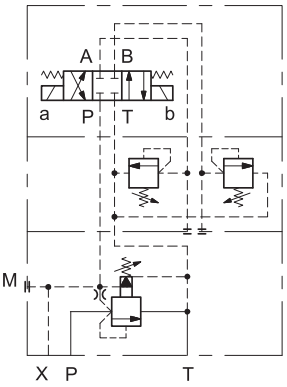
Available for side connection:
S04 = M16x1.5 - ISO 261 (only for power supply D24)
S01 = M20x1.5 - ISO 261 (available upon request only)

Manual override:
CM = manual override, boot protected (**standard for both N and V seals** - not available for NL seals)
CB = blind ring nut (**standard for NL seals** - available upon request for both N and V seals)
For dimension details of CB version, see paragraph 11

Option: surface treatment not standard. Omit if not required (see **NOTE 1**)

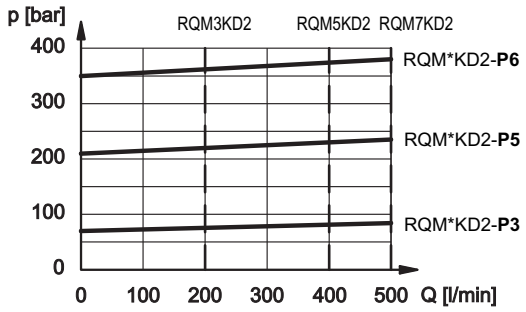
NOTE 1: the valve is supplied with standard surface treatment of phosphating black for the main body and zinc-nickel for the pilot body. Upon request we can supply these valves completely with zinc-nickel surface treatment; for this option add the suffix **/W7** at the end of the identification code.

2 - VERSIONS

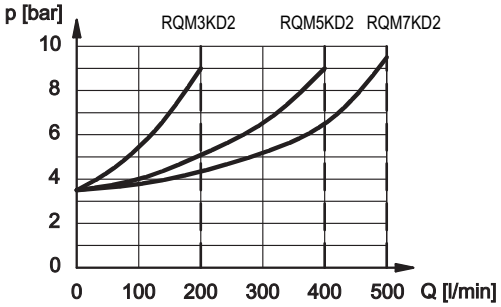
RQM*KD2-P*/**A**	RQM*KD2-P*/**B**	RQM*KD2-P*/**C**	RQM*KD2-P*/**D**	RQM*KD2-P*/**G**
				
1 pressure setting and unloading with de-energized solenoid	**1 pressure setting and unloading with energized solenoid**	**2 pressure settings The highest setting is reached with energized solenoid**	**2 pressure settings and unloading with de-energized solenoids**	**3 pressure settings The highest setting is reached with de-energized solenoids**

3 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

ADJUSTMENT



MINIMUM CONTROLLED PRESSURE



4 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - ATEX CLASSIFICATION, OPERATING TEMPERATURES AND ELECTRICAL CHARACTERISTICS

For valves suitable for application and installation in potentially explosive atmospheres, according to ATEX directive prescriptions, Duplomatic certificates the combination valve-coil; **the supply always includes the declaration of conformity to the directive and the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environments.**

Coils assembled on these valves have been separately certified according to ATEX directive and so they are suitable for use in potentially explosive atmospheres.

4.1 - Valve ATEX classification

The valves can be used for applications and installations in potentially explosive atmospheres that fall within either the ATEX II 2G or the ATEX II 2D classification, with the follow marking:

MARKING FOR GASES, VAPOURS, MISTS

for N and V seals:

II 2G IIC T4 Gb (-20°C Ta +80°C)

fori NL seals:

II 2G IIC T4 Gb (-40°C Ta +80°C)

EX Specific marking of explosion protection as ATEX 94/9/EC directive and related technical specification requests.

II: Group II for surface plants

2: Category 2 high protection, eligible for zone 1 (therefore also eligible for category 3 zone 2)

G: Type of atmosphere with gases, vapours, mists

IIC: Gas group (therefore also eligible for group IIA and IIB)

T4: Temperature class (max surface temperature)

Gb EPL protection level for electrical devices

-20°C Ta +80°C: Ambient temperature range for valves with both N and V seals

-40°C Ta +80°C: Ambient temperature range for valves with NL seals

MARKING FOR DUSTS

for N and V seals:

II 2D IIIC T154°C Db IP66/IP68 (-20°C Ta +80°C)

for NL seals:

II 2D IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)

EX Specific marking of explosion protection as ATEX 94/9/EC directive and related technical specification requests.

II: Group II for surface plants

2: Category 2 high protection, eligible for zone 21 (therefore also eligible for category 3 zone 22)

D: Type of atmosphere with dusts

IIIC: Dusts group (therefore also eligible for group IIIA and IIIB)

T154°C: Temperature class (max surface temperature)

Db EPL protection level for electrical devices

IP66/IP68: Protection degree from atmospheric agents according to IEC EN 60529

-20°C Ta +80°C: Ambient temperature range for valves with both N and V seals

-40°C Ta +80°C: Ambient temperature range for valves with NL seals

4.2 - Coils ATEX classification

The coil of the explosion-proof valves is identified with its own tag, which carries the relative ATEX marking. **The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an "Ex d" type protection (explosion-proof coil).**

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class. The R* coils (for alternating current supply) contain a built-in rectifier bridge.

Here below you find the coils marking:

MARKING FOR GASES, VAPOURS, MISTS

II 2G Ex d IIC T4 Gb (-40°C Ta +80°C)

EX: Specific marking of explosion protection as ATEX 94/9/EC directive and related technical specification requests.

II: Group II for surface plants

2: Category 2 high protection, eligible for zone 1 (therefore also eligible for category 3 zone 2)

G: Type of atmosphere with gases, vapours, mists

Ex d: "d" protection type, explosion-proof case

IIC: Gas group (therefore also eligible for group IIA and IIB)

T4: Temperature class (max surface temperature)

Gb: EPL protection level for electrical devices

-40°C Ta +80°C: Ambient temperature range

MARKING FOR DUSTS

II 2D Ex tb IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)

EX Specific marking of explosion protection as ATEX 94/9/EC directive and related technical specification requests.

II: Group II for surface plants

2: Category 2 high protection, eligible for zone 21 (therefore also eligible for category 3 zone 22)

D: Type of atmosphere with dusts

Ex tb: 'tb' protection type

IIIC: Dusts group (therefore also eligible for group IIIA and IIIB)

T154°C: Temperature class (max surface temperature)

Db: EPL protection level for electrical devices

IP66/IP68: Protection degree from atmospheric agents according to IEC EN 60529

-40°C Ta +80°C: Ambient temperature range

5.3 - Operating temperatures

The operating ambient temperature must be between -20 / +80 °C, for valves with both N and V seals and -40°C / +80°C, for valves with NL seals.

The fluid temperature must be between -20 / +80 °C, for valves with both N and V seals and -40°C / +80°C, for valves with NL seals.

The valves are classified in T4 temperature class (T154° C), therefore they are eligible for operation also at higher class temperature (T3, T2, T1 for gas and T200° C for dust).

VOLTAGE SUPPLY FLUCTUATION (ripple included)	± 10% Vnom
MAX SWITCH ON FREQUENCY	6.000 ins/hr
DUTY CYCLE	100%
EXPLOSION-PROOF VERSION	According to ATEX 94/9/EC
ELECTROMAGNETIC COMPATIBILITY (EMC)	According to 2004/108/EC
CLASS OF PROTECTION: Atmospheric agents Coil insulation (VDE 0580)	IP66 / IP68 class H

5.4 - Electrical characteristics (values ± 5%)

Coil type	Nominal voltage [V]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt. [W]
D12	12	7,2	1,7	20
D24	24	28,7	0,83	20
D48	48	115	0,42	20
D110	110	549	0,2	22

Coil type	Nominal voltage [V]	Freq. [Hz]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt. [VA]
R120	110V-50Hz 120V-60Hz	50/60	489,6	0,19	21
				0,21	25
R240	230V-50Hz 240V-60Hz		2067,7	0,098	22,5
				0,1	24

NOTE: type R* coils are for alternating current supply for both 50 or 60 Hz.
NOTE 1: for R* coils the resistance can not be measured in the usual way because of the presence of diodes bridge inside the coil.

6 - ELECTRICAL CONNECTION

6.1 - Wiring

In order to realise the electrical connection of the coil, it is necessary to access the terminal block (1) unscrewing the 4 screws (2) that fasten the cover (3) with the box (4) that contains the terminal block.

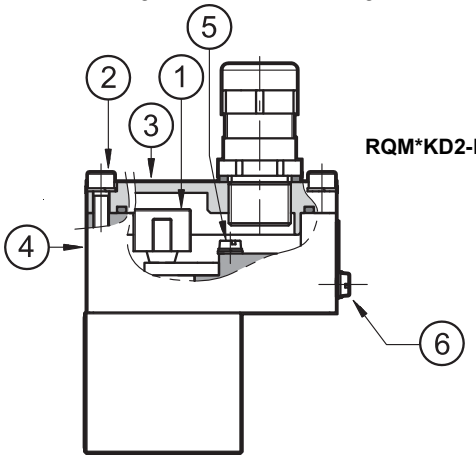
The electrical connection is polarity-independent.

By doing electrical connection it is important to connect also the grounding point (5) in the terminal block box (M4 screws), through suitable conductors with the general grounding line of the system.

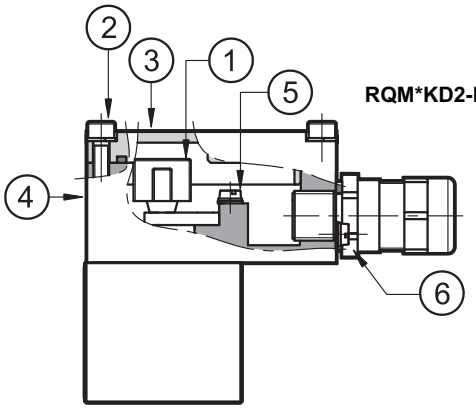
On the external body of the coil there is a grounding point (6) (M4 screw) that allow to ensure equipotentiality between the valve and the general grounding line of the system; connecting this point the regulation of the EN 13463-1 standard, that impose to verify the equipotentiality of the elements included in a potentially explosive environment (the maximum resistance between the elements must be 100 Ω), is guaranteed.

At the end of the electrical wiring, it is necessary to reassemble the cover (3) on the box (4), checking the correct positioning of the seal located in the cover seat and fastening the 4 M5 screws with a torque of 4.9÷6 Nm.

Electrical wiring must be done following the instructions of the rules in compliance with ATEX standards.



RQM*KD2-P*/*/10*-*K9T*/*



RQM*KD2-P*/*/10*-*K9S*/*

Characteristics of the cables connectable for wiring are indicated in the table below:

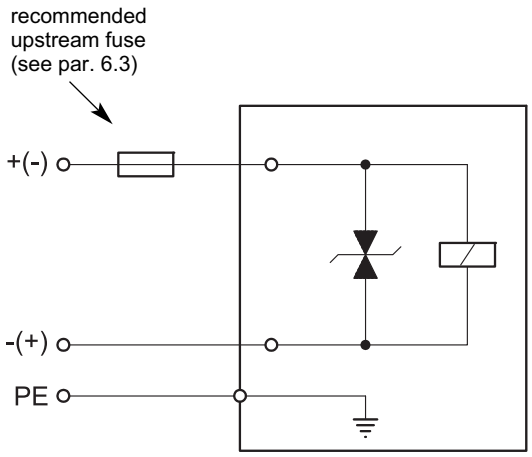
Function	Cable section
Operating voltage cables connection	max 2.5 mm²
Connection for internal grounding point	max 2.5 mm²
Connection for external equipotential grounding point	max 6 mm²

Cables for wiring must be non-armoured cables, with external covering sheath and must be suitable for use in environments with temperatures from - 20 °C to +110 °C (for valves either with N or V seals) or from - 40 °C to +110 °C (for valves with NL seals).

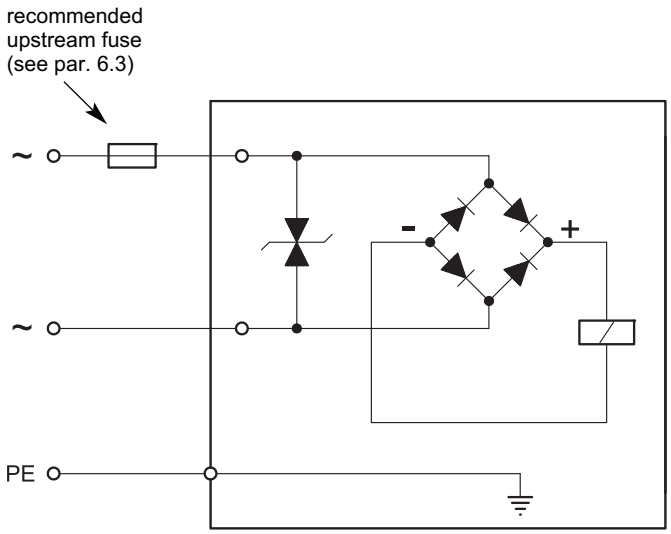
Cable glands (which must be ordered separately, see paragraph 12) allow to use cables with external diameter between 8 and 10 mm.

6.2 - Electrical diagrams

DC coil



RAC coil



6.3 - Overcurrent fuse and switch-off voltage peak

Upstream of each valve, an appropriate fuse (max 3 x In according to IEC 60127) or a protective motor switch with short-circuit and thermal instantaneous tripping, as short-circuit protection, must be connected. The cut-off power of the fuse must correspond or exceed the short circuit current of the supply source. The fuse or the protective motor must be placed outside the dangerous area or they must be protected with an explosion-proof covering.

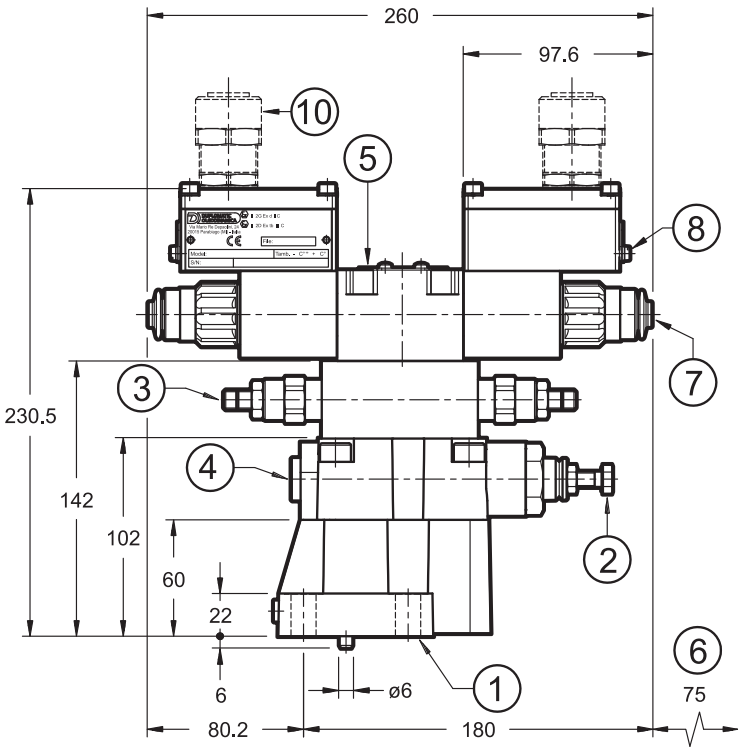
In order to safeguard the electronic device to which the valve is connected, there is a protection circuit in the coil, that reduces voltage peaks, which can occur when inductances are switched off.

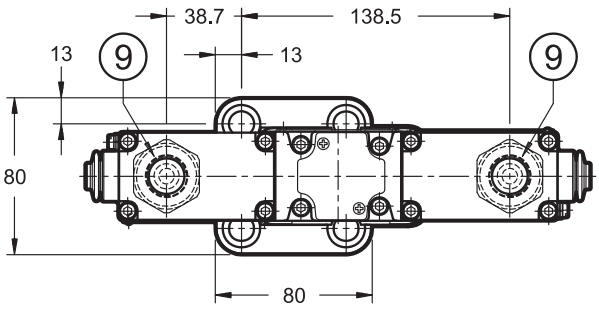
The table shows the type of fuse recommended according to the nominal voltage of the valve and to the value of the voltage peaks reduction.

Coil type	Nominal voltage [V]	Rated current [A]	**Recommended pre-fuse characteristics medium time-lag according to DIN 41571 [A]**	Maximum voltage value upon switch off [V]	Suppressor circuit
D12	12	1,7	2,5	- 49	Transient voltage suppressor bidirectional
D24	24	0,83	1,25	- 49	
D48	48	0,42	0,6	- 81	
D110	110	0,2	0,3	- 309	
R120	120	0,21	0,3	- 3	
R240	240	0,1	0,15	- 3	

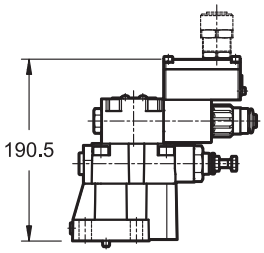
7 - RQM3KD2-P OVERALL AND MOUNTING DIMENSIONS

RQM3KD2-P*/G/10*-*K9T*

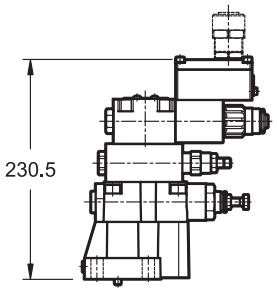




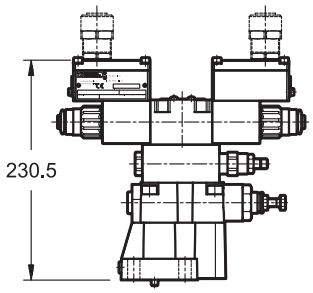
RQM3KD2-P*/A/10*-*K9T*
RQM3KD2-P*/B/10*-*K9T*



RQM3KD2-P*/C/10*-*K9T*



RQM3KD2-P*/D/10*-*K9T*



dimensions in mm

1	Mounting surface
2	Hexagonal head main pressure adjustment screw: Spanner 13 Clockwise rotation to increase pressure
3	Second value pressure adjustment valve. Countersunk hex adjustment screw: Spanner 5 Clockwise rotation to increase pressure
4	Pressure gauge port 3/8” BSP
5	ISO 4401-03 (CETOP 03) solenoid valve for pressure selection / unloading with explosion-proof coils

6	Coil removal space
7	Manual override, boot protected (**standard for both N and V seals**) - for blind ring nut dimensions (standard for NL seals) see par. 11
8	Terminal for supplementary earth connection
9	Upper port for cable gland
10	Cable gland (upper port shown). To be ordered separately, see paragraph 12

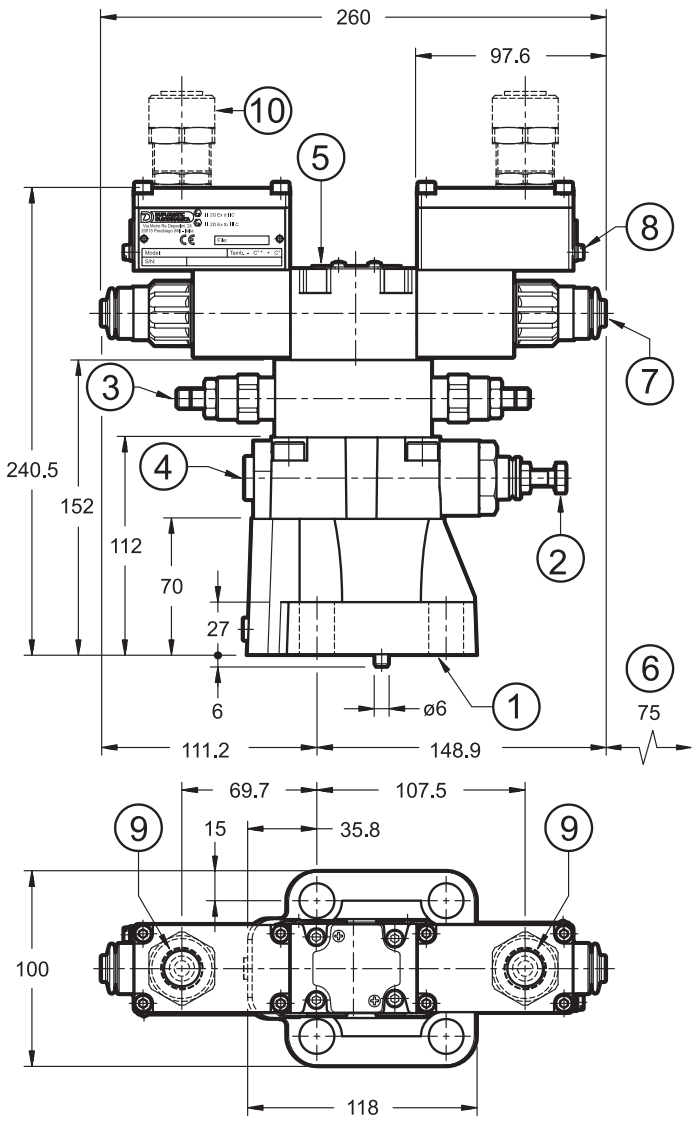
NOTE: for side port cable gland see paragraph 10.

Valve	Mass
RQM3KD2-P*/A and RQM3KD2-P*/B	5,3
RQM3KD2-P*/C	6,4
RQM3KD2-P*/D	7,3
RQM3KD2-P*/G	7,4

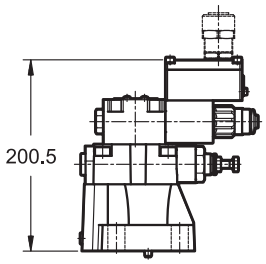
Fastening of single valve: N. 4 SHC screws M12x40 ISO 4762
Tightening torque: 69 Nm
Threads of mounting holes: M12x20
Sealing rings: N. 2 OR type 123 (17.86x2.62) - 90 Shore N. 1 OR type 109 (9.13x2.62) - 90 Shore

8 - RQM5KD2-P OVERALL AND MOUNTING DIMENSIONS

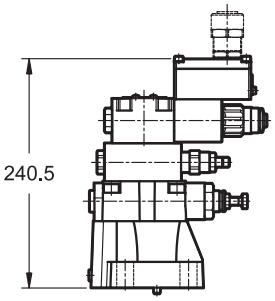
RQM5KD2-P*/G/10*-*K9T*



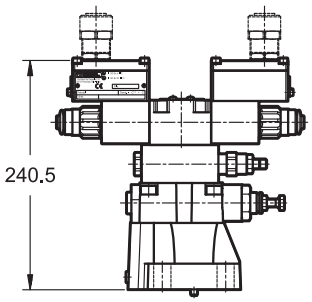
RQM5KD2-P*/A/10*-*K9T*
RQM5KD2-P*/B/10*-*K9T*



RQM5KD2-P*/C/10*-*K9T*



RQM5KD2-P*/D/10*-*K9T*



dimensions in mm

1	Mounting surface
2	Hexagonal head main pressure adjustment screw: Spanner 13 Clockwise rotation to increase pressure
3	Second value pressure adjustment valve. Countersunk hex adjustment screw: Spanner 5 Clockwise rotation to increase pressure
4	Pressure gauge port 3/8” BSP
5	ISO 4401-03 (CETOP 03) solenoid valve for pressure selection / unloading with explosion-proof coils

6	Coil removal space
7	Manual override, boot protected (**standard for both N and V seals**) - for blind ring nut dimensions (standard for NL seals) see par. 11
8	Terminal for supplementary earth connection
9	Upper port for cable gland
10	Cable gland (upper port shown). To be ordered separately, see paragraph 12

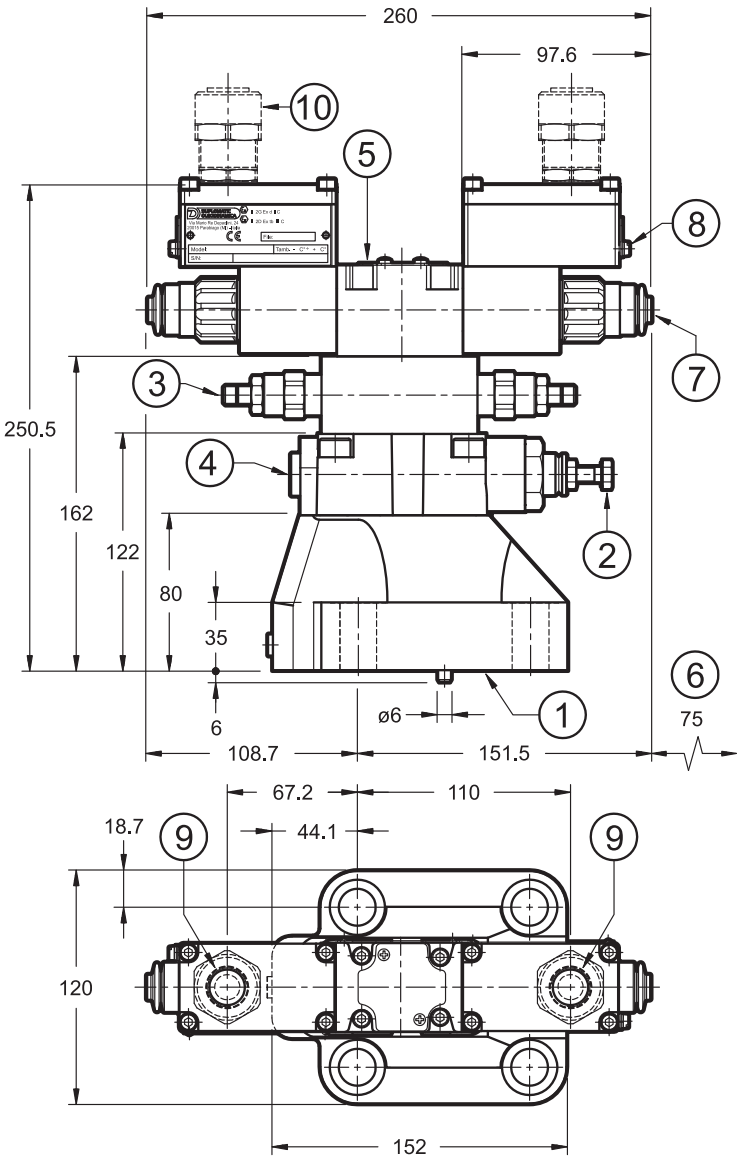
NOTE: for side port cable gland see paragraph 10.

Valve	Mass
RQM5KD2-P*/A and RQM5KD2-P*/B	6,3
RQM5KD2-P*/C	7,4
RQM5KD2-P*/D	8,3
RQM5KD2-P*/G	8,4

Fastening of single valve: N. 4 SHC screws M16x50 ISO 4762
Tightening torque: 170 Nm
Threads of mounting holes: M16x25
Sealing rings: N. 2 OR type 3118 (29.82x2.62) - 90 Shore N. 1 OR type 109 (9.13x2.62) - 90 Shore

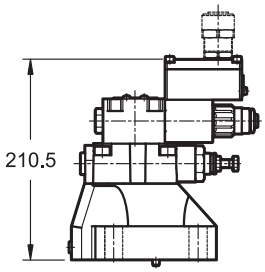
9 - RQM7KD2-P OVERALL AND MOUNTING DIMENSIONS

RQM7KD2-P*/G/10*-*K9T*

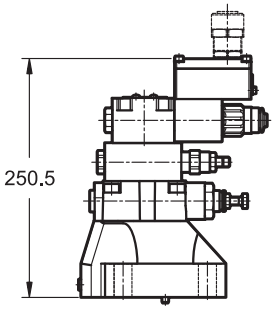


dimensions in mm

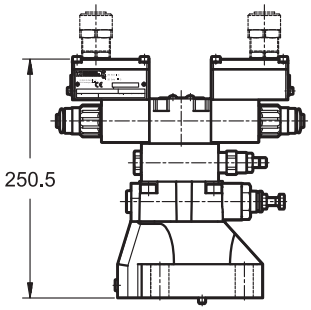
RQM7KD2-P*/A/10*-*K9T*
RQM7KD2-P*/B/10*-*K9T*



RQM7KD2-P*/C/10*-*K9T*



RQM7KD2-P*/D/10*-*K9T*



1	Mounting surface
2	Hexagonal head main pressure adjustment screw: Spanner 13 Clockwise rotation to increase pressure
3	Second value pressure adjustment valve. Countersunk hex adjustment screw: Spanner 5 Clockwise rotation to increase pressure
4	Pressure gauge port 3/8” BSP
5	ISO 4401-03 (CETOP 03) solenoid valve for pressure selection / unloading with explosion-proof coils

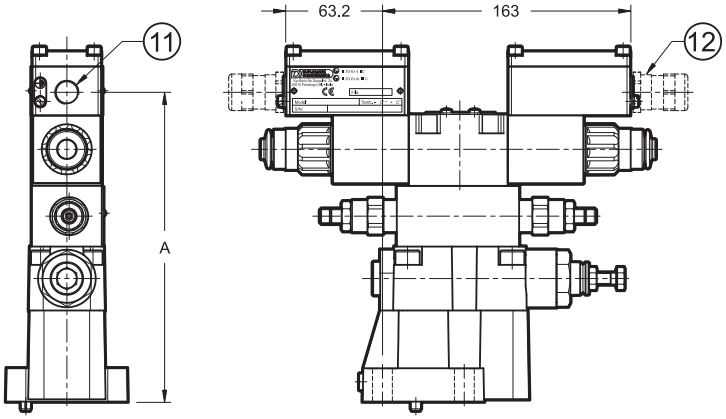
6	Coil removal space
7	Manual override, boot protected (**standard for both N and V seals**) - for blind ring nut dimensions (standard for NL seals) see par. 11
8	Terminal for supplementary earth connection
9	Upper port for cable gland
10	Cable gland (upper port shown). To be ordered separately, see paragraph 12

NOTE: for side port cable gland see paragraph 10.

Valve	Mass
RQM7KD2-P*/A and RQM7KD2-P*/B	8,5
RQM7KD2-P*/C	9,6
RQM7KD2-P*/D	10,5
RQM7KD2-P*/G	10,6

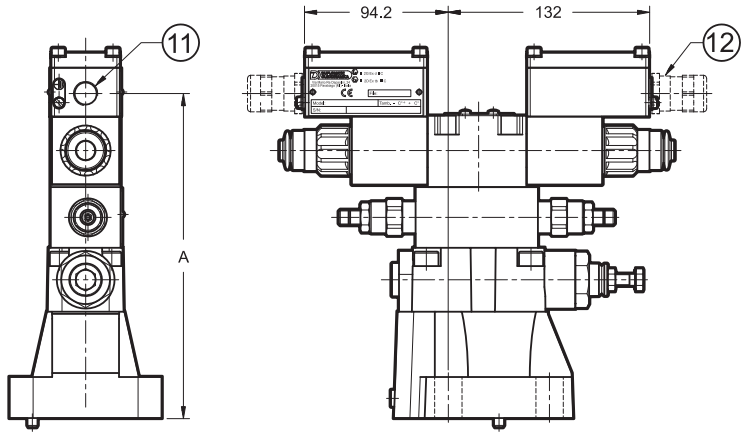
Fastening of single valve: N. 4 SHC screws M18x60 ISO 4762
Tightening torque: 235 Nm
Threads of mounting holes: M18x27
Sealing rings: N. 2 OR type 4137 (34.52x3.53) - 90 Shore N. 1 OR type 109 (9.13x2.62) - 90 Shore

10 - RQM*KD2-P*/*/10*-*K9S*/* (SIDE CONNECTION) OVERALL AND MOUNTING DIMENSIONS



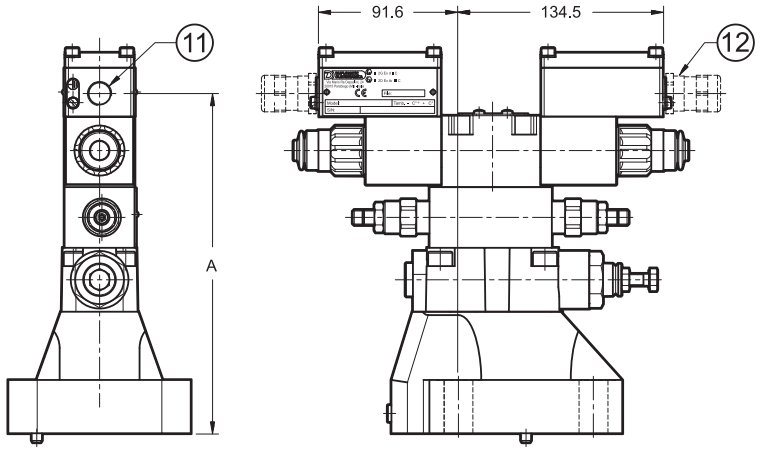
RQM3KD2-P*/*/10*-*K9S*

Side port type	Dimension A	
	RQM3KD2-P*/A RQM3KD2-P*/B	RQM3KD2-P*/C RQM3KD2-P*/D RQM3KD2-P*/G
S01	162.5	202.5
S04	163.5	203.5



RQM5KD2-P*/*/10*-*K9S*

Side port type	Dimension A	
	RQM5KD2-P*/A RQM5KD2-P*/B	RQM5KD2-P*/C RQM5KD2-P*/D RQM5KD2-P*/G
S01	172.5	212.5
S04	173.5	213.5



RQM7KD2-P*/*/10*-*K9S*

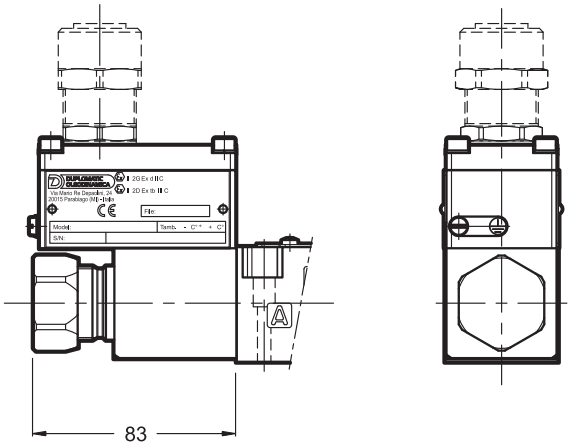
Side port type	Dimension A	
	RQM7KD2-P*/A RQM7KD2-P*/B	RQM7KD2-P*/C RQM7KD2-P*/D RQM7KD2-P*/G
S01	182.5	222.5
S04	183.5	223.5

dimensions in mm

11	Side port
12	Cable gland (side port shown). To be ordered separately, see par. 12

11 - MANUAL OVERRIDE

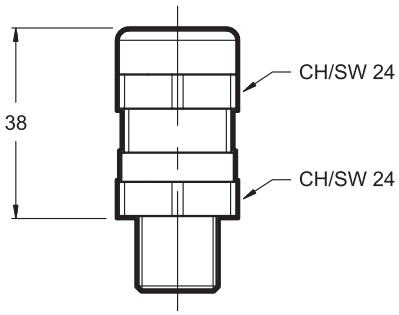
11.1 - CB - Blind ring nut



12 - CABLE GLANDS

Cable glands must be ordered separately; Duplomatic offers some types of cable glands with the following features:

- version for non-armoured cable, external seal on the cable (suitable for Ø8÷10 mm cables);
- according to ATEX II 2GD directive certified
- cable gland material: nickel brass
- rubber tip material: silicone
- ambient temperature range: -70ºC ÷ +220ºC
- protection degree: IP66 / IP68



For the request of the version needed, indicate the description and the code mentioned here below:

Description: CGK2/NB-01/10
Code: 3908108001
Version with M20x1.5 - ISO 261 male thread, suitable for coils with T01 and S01 connection types; it is supplied equipped with silicone seal, that must be assembled between the cable gland and the coil cover, so as to ensure IP66 / IP68 protection degree.

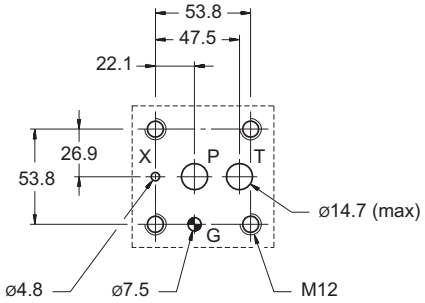
Description: CGK2/NB-02/10
Code: 3908108002
Version with Gk 1/2 - UNI EN 10226-2 male thread, suitable for coils with T02 connection type; in order to ensure IP66 / IP68 protection degree, the customer must apply LOCTITE® 243™ threadlocker or similar between the cable gland connection thread and the coil cover.

Description: CGK2/NB-03/10
Code: 3908108003
Version with 1/2” NPT - ANSI B1.20.1 (ex ANSI B2.1), suitable for coils with T03 connection type; in order to ensure IP66 / IP68 protection degree, the customer must apply LOCTITE® 243™ threadlocker or similar between the cable gland connection thread and the coil cover.

Description: CGK2/NB-04/10
Code: 3908108004
Version with M16x1.5 - ISO 261 male thread, suitable for coils with S04 connection type; it is supplied equipped with silicone seal, that must be assembled between the cable gland and the coil cover, so as to ensure IP66 / IP68 protection degree.

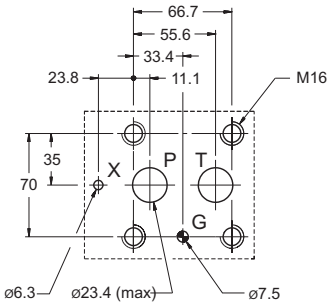
13 - MOUNTING SURFACES

RQM3KD2-P



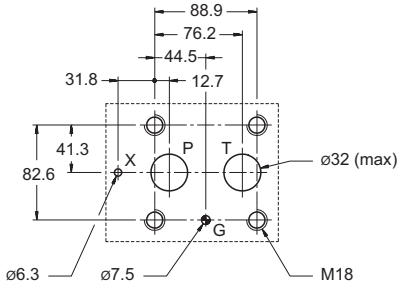
ISO 6264-06-09-*-97 (CETOP 4.4.2-2-R06-350)

RQM5KD2-P



ISO 6264-08-13-*-97 (CETOP 4.4.2-2-R08-350)

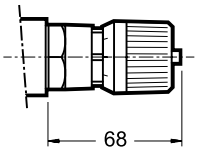
RQM7KD2-P



ISO 6264-10-17-*-97 (CETOP 4.4.2-2-R10-350)

14 - ADJUSTMENT KNOB

The valves can be equipped with a SICBLOC adjustment knob, only on the main pressure regulation. To operate it, push and rotate at the same time. To request this option, add: /**M** (see paragraph 1).



15 - SUBPLATES (see catalogue 51 000)

	RQM3KD2-P	RQM5KD2-P	RQR7KD2-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports
P, T ports dimension	P: 1/2” BSP T: 3/4” BSP	1” BSP	1” 1/4 BSP
X port dimension	1/4” BSP	1/4” BSP	1/4” BSP

NOTE: Subplates (to be ordered separately) do not contain neither aluminium nor magnesium at a higher rate than the value allowed by norms according to ATEX directive for category 2GD.

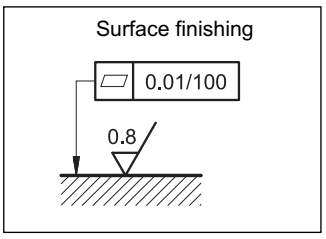
The user must take care and make a complete assessment of the ignition risk, that can occur from the relative use in potentially explosive environments.

16 - INSTALLATION

The valves can be installed in any position without impairing correct operation.

Valve fastening takes place by means of screws or tie rods, laying the valve on a lapped surface, with values of planarity and smoothness that are equal to or better than those indicated in the drawing.

If the minimum values of planarity or smoothness are not met, fluid leakages between valve and mounting surface can easily occur.



DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com

Z*-P

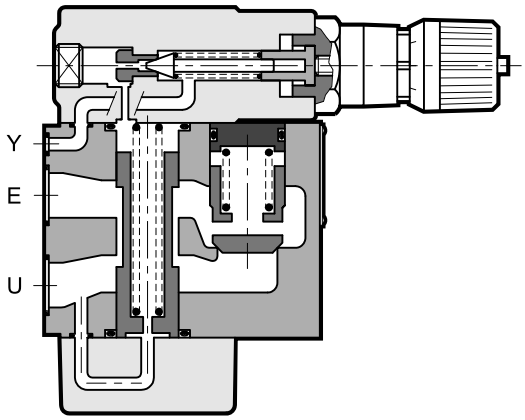
PRESSURE REDUCING VALVES

SERIES 22

SUBPLATE MOUNTING

Z3-P ISO 5781-06 (CETOP 06)
Z5-P ISO 5781-08 (CETOP 08)

OPERATING PRINCIPLE



— The Z*-P type valves are used when a branch with a lower pressure than the main one is desired in the hydraulic circuits.

Being normally open, they allow passage of oil up to the point when the outlet pressure is less than that set on the valve; the valve closes and keeps the outlet pressure constant when it reaches the set value. The intake pressure fluctuation, for values greater than the set values, does not affect the reduced outlet pressure, and furthermore the particular design of the valve prevents exceeding the set value even in transients.

The drainage, to be connected directly to the tank, discharges about 0,8 l/min. The valves are available, upon request, with reduced drainage (0,4 l/min).

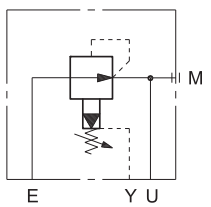
— Available even with incorporated check valve upon request, with cracking pressure of 0,5 bar.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

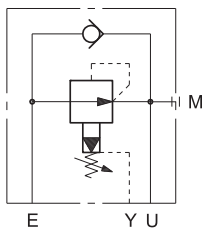
		Z3-P	Z5-P
Maximum operating pressure	bar	250	
Maximum flow rate	l/min	40	110
Drain flow rate: for Z*-P for Z*-P*R	l/min	0,8 0,4	
Ambient temperature range	°C	-20 / +50	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 ÷ 400	
Fluid contamination degree	According to ISO 4406:1999 classe 20/18/15		
Recommended viscosity	cSt	25	
Mass	kg	3,9	6,1

HYDRAULIC SYMBOLS

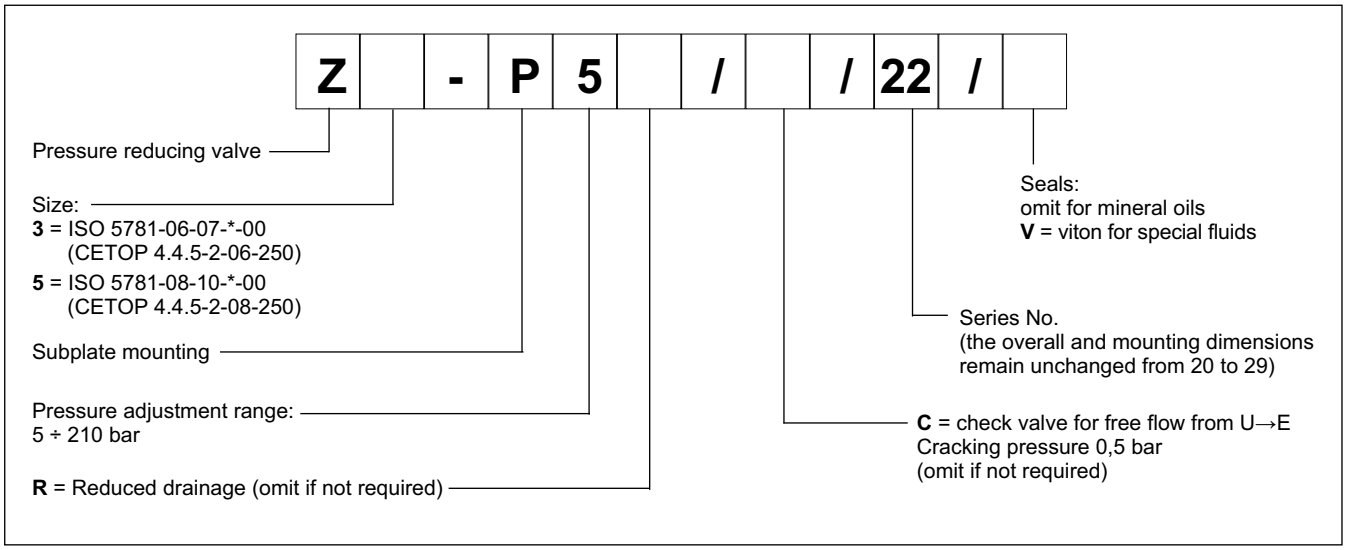
Z*-P



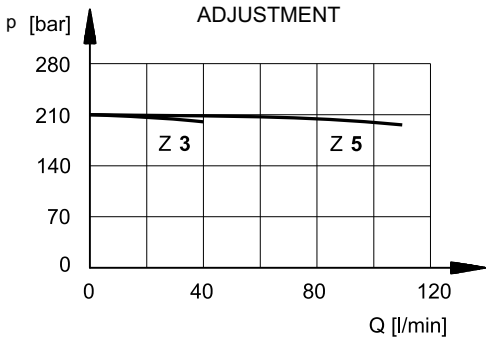
Z*-P/C

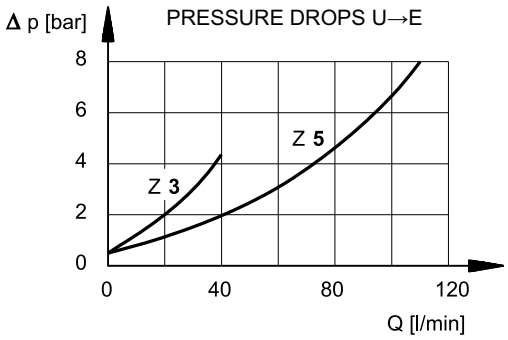


1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)





3 - HYDRAULIC FLUIDS

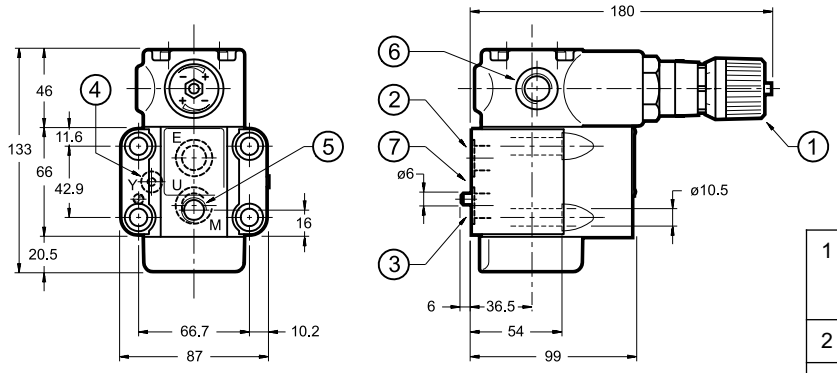
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V).

For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

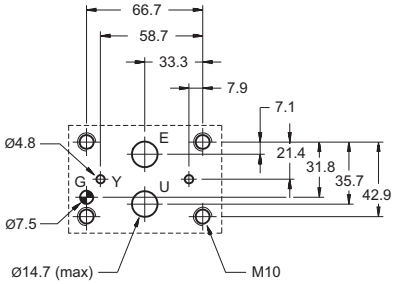
The fluid must be preserved in its physical and chemical characteristics.

4 - Z3-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



MOUNTING SURFACE:
ISO 5781-06-07-*-00 (CETOP 4.4.5-2-06-250)



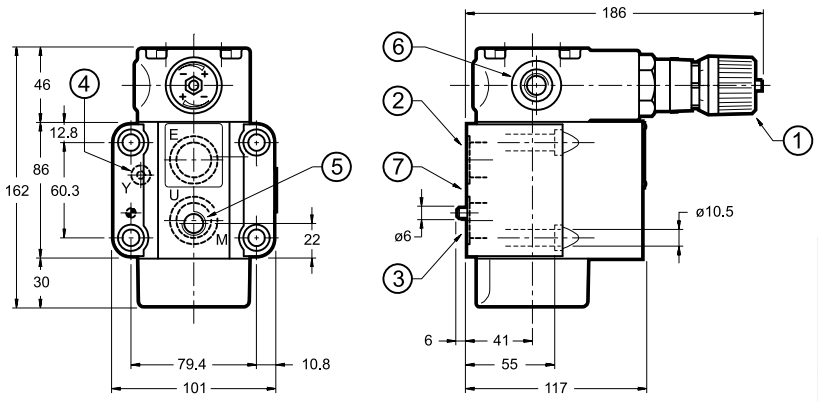
NOTE: the position of the Y port corresponds to the position of the X port provided for by the ISO Standard

1	SICBLOC adjustment knob. To operate, push and rotate at the same time.
2	Intake
3	Outlet port
4	Drainage port
5	Pressure gauge port 1/4” NPT
6	Supplementary tube port for drainage 1/4” BSP
7	Mounting surface with sealing rings: N. 2 OR type 3068 (17.13x2.62) N. 2 OR type 2021 (5.28x1.78) 90 Shore

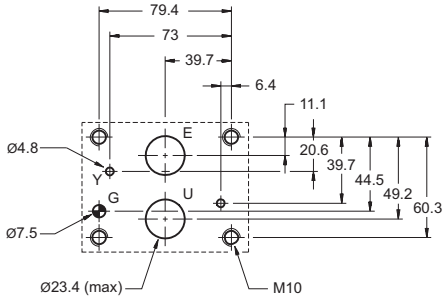
FASTENING BOLTS:
4 bolts M10x70
Tightening torque: 40 Nm

5 - Z5-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



MOUNTING SURFACE:
ISO 5781-08-10-*-00 (CETOP 4.4.5-2-08-250)



NOTE: the position of the Y port corresponds to the position of the X port provided for by the ISO Standard

1	SICBLOC adjustment knob. To operate, push and rotate at the same time.
2	Intake
3	Outlet port
4	Drainage port
5	Pressure gauge port 1/4” NPT
6	Supplementary plug for drainage 1/4” BSP
7	Mounting surface with sealing rings: N. 2 OR type 3100 (25.07x2.62) 90 Shore N. 2 OR type 2021 (5.28x1.78) 90 Shore

FASTENING BOLTS:
4 bolts M10x70
Tightening torque: 40 Nm

6 - SUBPLATES (see catalogue 51 000)

	Z3-P	Z5-P
Type	PMSZ3-AI4G with rear ports	PMSZ5-AI6G with rear ports
Port dimensions: - E, U - X, Y	 1/2" BSP 1/4" BSP	 1" BSP 1/4" BSP

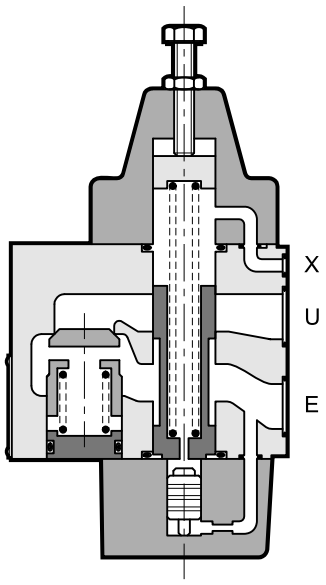
DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com

S*-P
SEQUENCE VALVE
U*-P
UNLOADING VALVE
T*-P
BACKPRESSURE VALVE
X*-P
BALANCING VALVE

SERIES 20

OPERATING PRINCIPLE



— The S U T X sequence valves are used for pressure control. They are direct-acting and normally closed.

— They are available in two nominal sizes for flows up to 150 l/min and in four pressure adjustment ranges.

— Opening takes place by means of a pilot pressure that, acting on a small piston, resists the force of the adjustment spring.

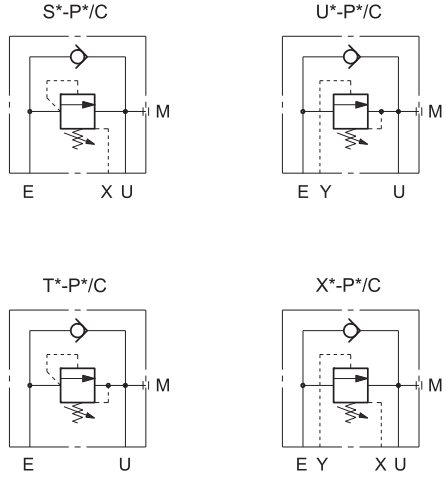
— The valve can be easily modified to get any one of the four versions **S**, **U**, **T**, **X**, turning the upper and the bottom covers in order to obtain the X and Y internal connections, as indicated in par. 7.

The figure represents the section of a type S valve.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		size 3	size 5
Maximum operating pressure	bar	320	250
Maximum flow rate	l/min	4060	150
Ambient temperature range	°C	-20 / +50	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 ÷ 400	
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15		
Recommended viscosity	cSt	25	
Mass	kg	5,8	6,7

HYDRAULIC SYMBOLS



1 - IDENTIFICATION CODE

		-	P		/		/	20	/	

Valve type:
S = sequence valve
U = unloading valve
T = backpressure valve
X = balancing valve

Size:
3 = ISO 5781-06 (CETOP 06)
5 = ISO 5781-08 (CETOP 08)

Subplate mounting

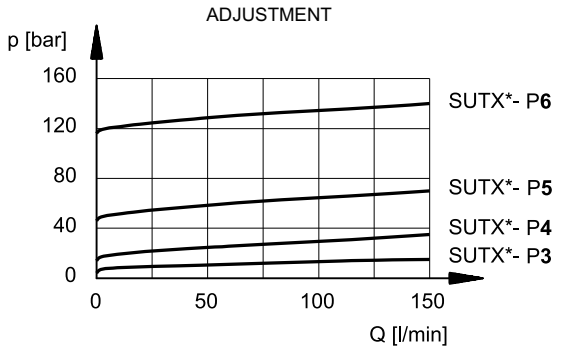
Pressure adjustment range:
3 = 5 ÷ 20 bar
4 = 10 ÷ 35 bar
5 = 15 ÷ 70 bar
6 = 35 ÷ 140 bar

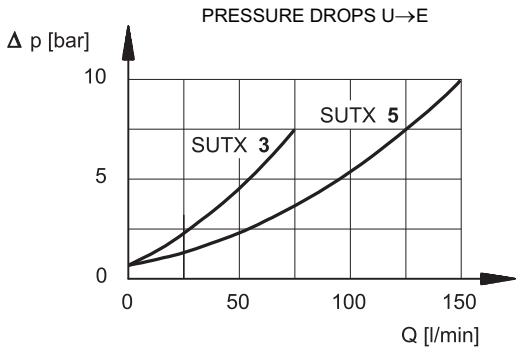
C = check valve for free flow from U to E.
Cracking pressure 0,5 bar.
(omit for version without check valve)

Series No. (the overall and mounting dimensions remain unchanged from 20 to 29)

Seals:
omit for mineral oils
V = viton for special fluids

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

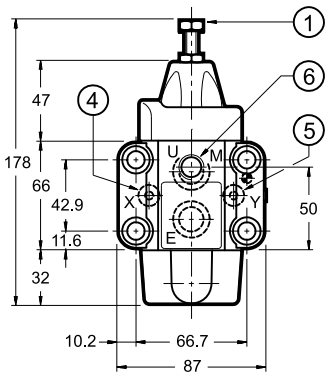


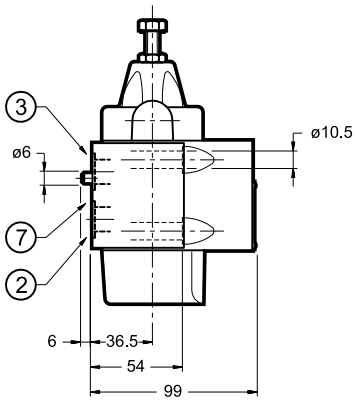


3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.
The fluid must be preserved in its physical and chemical characteristics.

4 - S U T X 3-P OVERALL AND MOUNTING DIMENSIONS

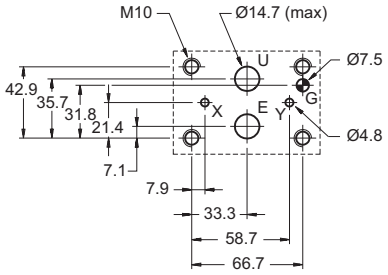




FASTENING BOLTS:
4 bolts M10x70
Tightening torque: 40 Nm

dimensions in mm

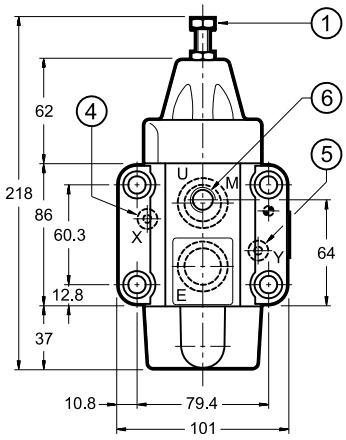
MOUNTING SURFACE:
ISO 5781-06-07-*-00 (CETOP 4.4.4-2-06-320)

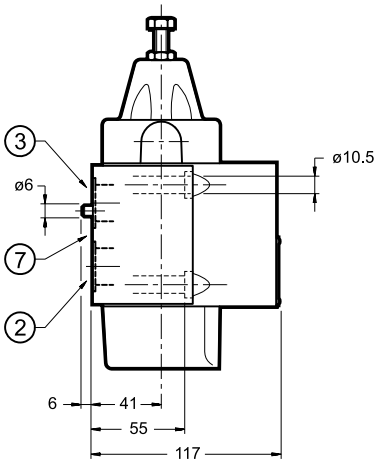


NOTE: the positions of the X and Y ports are reversed from the requirements of the ISO Standard

1	Hexagonal head adjustment screw. Spanner 13.
2	Intake port
3	Outlet port
4	External drainage port
5	External piloting port
6	Pressure gauge port 1/4” NPT
7	Mounting surface with sealing rings: N. 2 OR type 3068 (17.13x2.62)- 90 Shore N. 2 OR type 2021 (5.28x1.78) - 90 Shore

5 - S U T X 5-P OVERALL AND MOUNTING DIMENSIONS

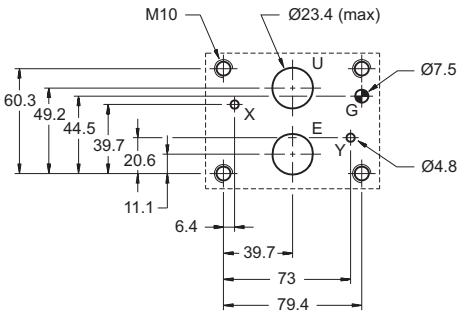




FASTENING BOLTS:
4 bolts M10x70
Tightening torque: 40 Nm

dimensions in mm

MOUNTING SURFACE:
ISO 5781-08-10-*-00 (CETOP 4.4.5-2-08-320)



NOTE: the positions of the X and Y ports are reversed from the requirements of the ISO Standard

1	Hexagonal head adjustment screw. Spanner 13.
2	Intake port
3	Outlet port
4	External drainage port
5	External piloting port
6	Pressure gauge port 1/4” NPT
7	Mounting surface with sealing rings: N. 2 OR type 3100 (25.07x2.62) - 90 Shore N. 2 OR type 2021 (5.28x1.78) - 90 Shore

6 - APPLICATIONS

"S" The type "S" sequence valve is normally used to successively command two or more actuators: when the pressure in the primary circuit reaches the set value on the valve, it opens and allows the fluid to feed the second circuit branch, keeping the pressure in the first branch.

The valve remains open until the pressure at the intake falls below the set value; under these conditions, the maximum pressure setting on the first circuit branch will be achieved also at the outlet.

It is also used to keep a circuit under pressure when simultaneous supply of various users, requiring the total delivery of the pump, would make the pressure value decrease.

"U" This is normally used in automatic circuits (high-low pressure) for unloading the low pressure pump; this occurs when the pressure in the circuit reaches the set value of the valve.

In this manner it is possible to utilize the total flow of the two pumps for fast movements at low pressure, with electric power saving, using high pressure only for working movements.

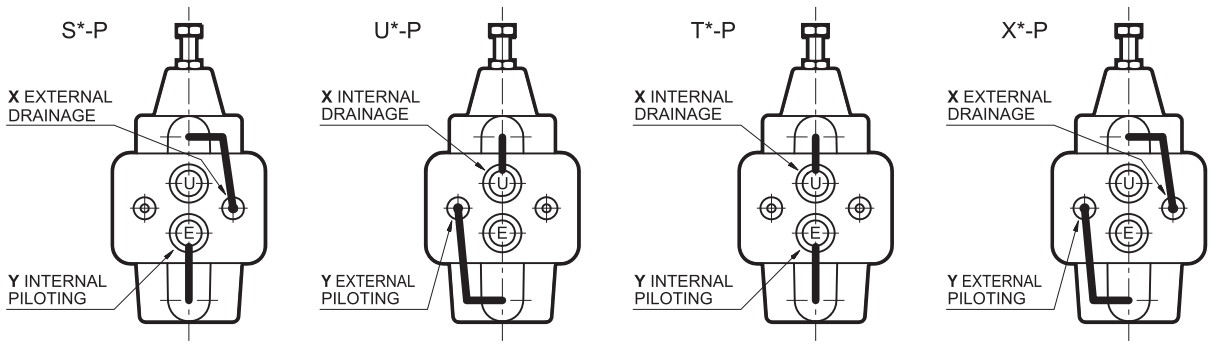
Furthermore, it is used to allow quick discharge of the large chamber of a high differential cylinder which the directional valve would not be able to drain; in this case the valve piloting is connected to the small chamber of the cylinder.

"T" Normally this is used to create hydraulic resistance (back pressure) to prevent uncontrolled movements, especially in the case of suspended loads.

The valve, normally closed, opens only when the set pressure is reached, and thus the descent of the load occurs in a controlled manner and the descending speed depends on the delivery of the pump.

"X" This is mainly used for load balancing. The piloting pressure can be taken from any point in the plant. The valve stays closed until the pilot pressure reaches the set value.

7 - COVER ORIENTATION FOR ALL THE VERSIONS S, U, T, X



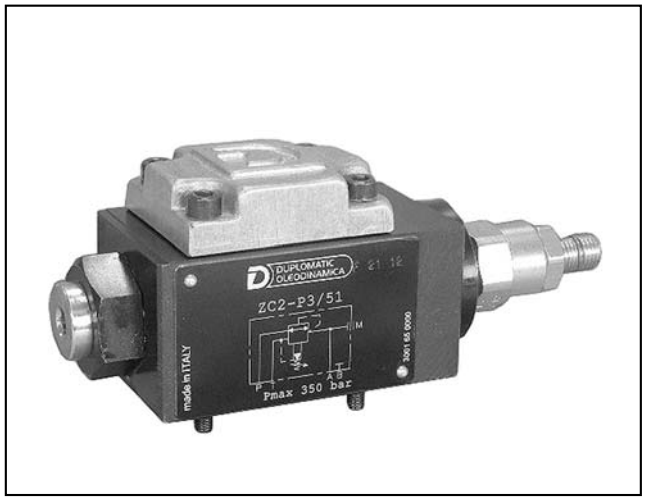
NOTE: in this kind of valves Y is the piloting port while X is the drainage port

7 - SUBPLATES (see catalogue 51 000)

		SIZE 3	SIZE 5
Type with rear ports		PMSZ3-AI4G	PMSZ5-AI5G
Ports dimensions:	E, U X, Y	1/2" BSP 1/4" BSP	1" BSP 1/4" BSP

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com



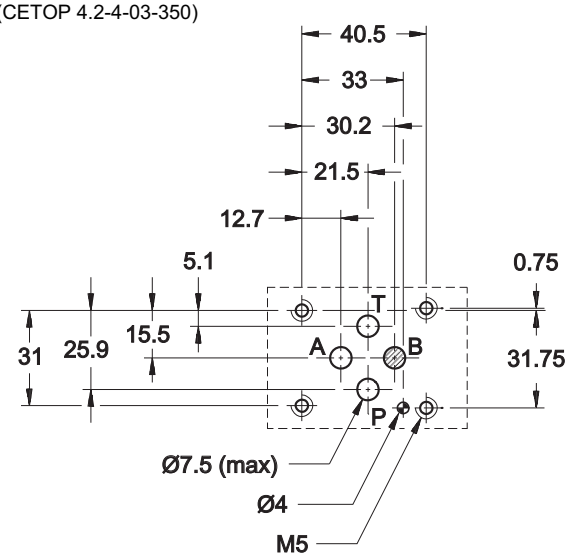
ZC2
BALANCING VALVES
SERIES 51

SUBPLATE MOUNTING
ISO 4401-03 (CETOP 03)

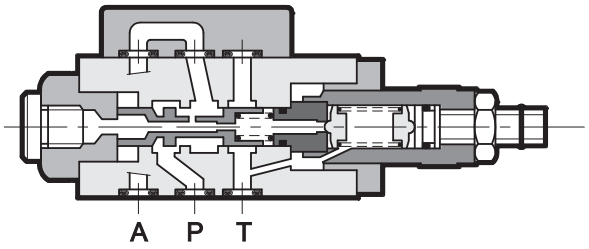
p max **350** bar
Q max **25** l/min

MOUNTING INTERFACES

ISO 4401-03-02-0-05
(CETOP 4.2-4-03-350)



OPERATING PRINCIPLE



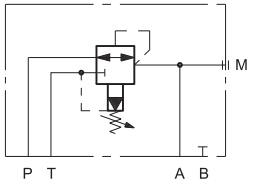
— The type ZC2 balancing valves act as pressure reducing valves that, besides reducing the pressure from line P to user A, allow the flow to return from user A to discharge T when a pressure greater than the set value is generated in the downstream circuit (user A). (A typical case of hydraulic counterweight or load balancing)

— They have a mounting surface in accordance with ISO 4401 (CETOP RP121H) standards. Port B is never used.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

Maximum operating pressure	bar	350
Maximum flow rate	l/min	25
Ambient temperature range	°C	-20 / +50
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	1,3

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

Z	C	2	-	P		/		/	51	/	

Balancing valve

Size: ISO 4401-03 (CETOP 03)

Subplate mounting

Pressure adjustment range:
3 = 10 ÷ 70 bar **4** = 30 ÷ 140 bar **5** = 50 ÷ 210 bar

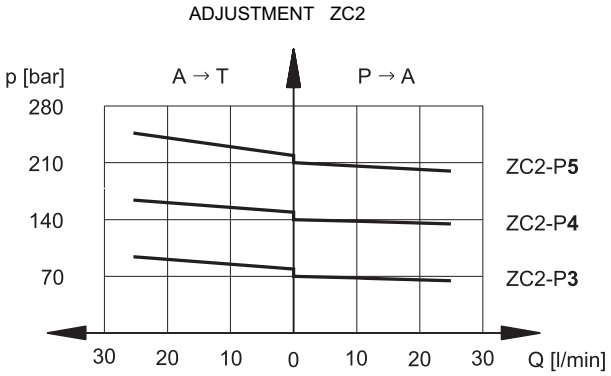
M1= Adjustment knob
(omit for adjustment with countersunk hex screw)

Series No.
(the overall and mounting dimensions remain unchanged from 50 to 59)

Seals:
omit for mineral oils
V = viton for special fluids

2 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)



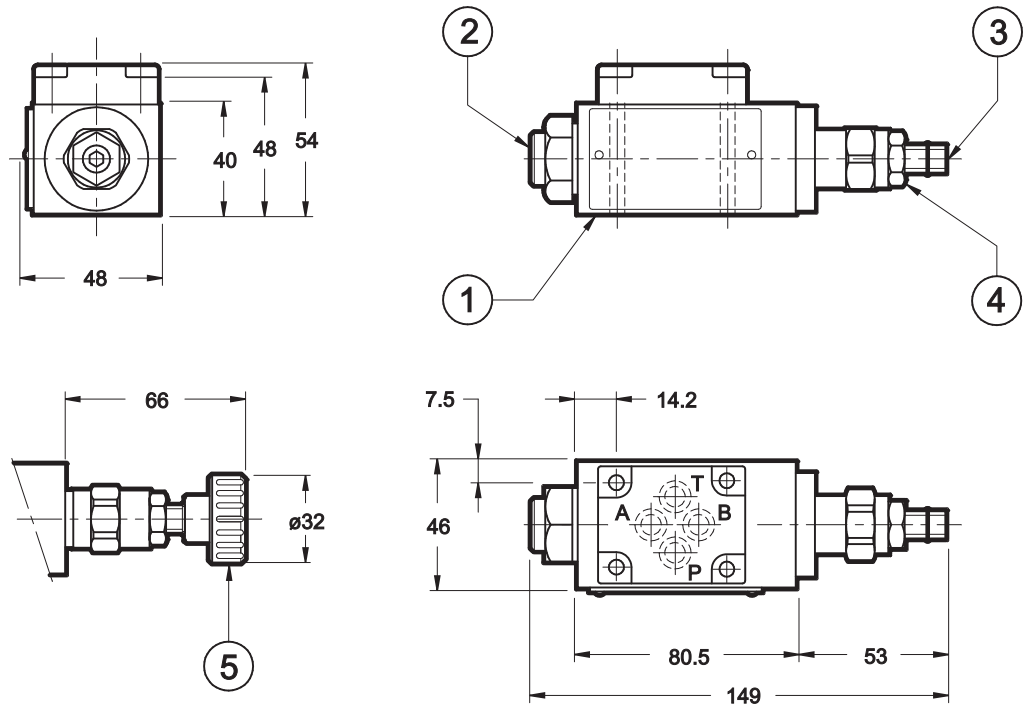
3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - ZC2 OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

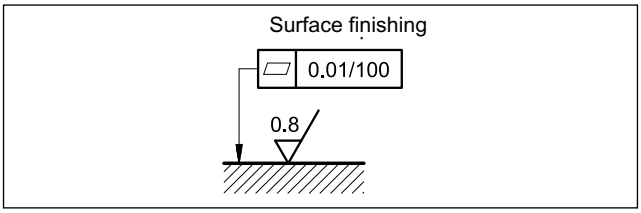


1	Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) 90 Shore
2	Pressure gauge port 1/4” BSP
3	Countersunk hex adjustment screw: Spanner 5. Clockwise rotation to increase pressure
4	Locking nut: spanner 17
5	Adjustment knob: M1

9 - INSTALLATION

The ZC2 valves can be installed in any position without impairing correct operation.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.



6 - FASTENING BOLTS

Fastening bolts are delivered with the valve.

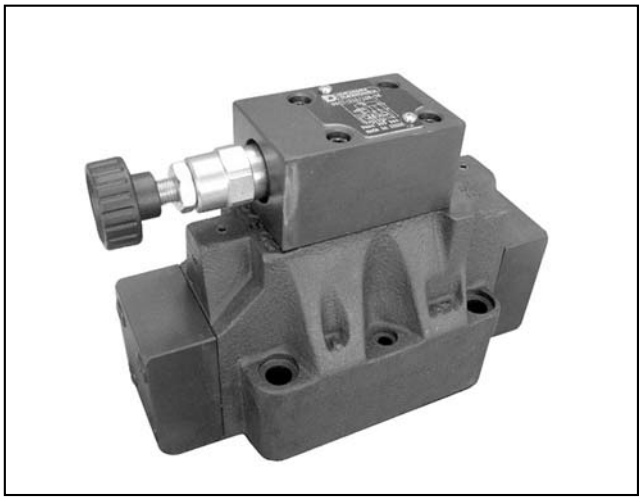
N. 4 bolts M5x55
Tightening torque: 5Nm (A screws 8.8)

7 - SUBPLATES (see cat. 51 000)

Type PMMD-AI3G ports on rear 3/8” BSP
Type PMMD-AL3G side ports3/8” BSP

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com



DZC*

BALANCING VALVE

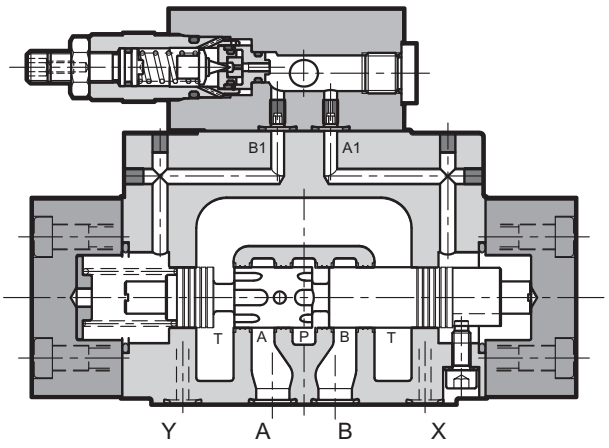
SERIES 10

DZC5	**CETOP P05**
DZC5R	**ISO 4401-05** (CETOP R05)
DZC7	**ISO 4401-07** (CETOP 07)
DZC8	**ISO 4401-08** (CETOP 08)

p max **350** bar

Q max (see table of performances)

OPERATING PRINCIPLE



— The type DZC* balancing valves act as pressure reducing valves that, besides reducing the pressure from line P to user A, allow the flow to return from user A to discharge T when a pressure greater than the set value is generated in the downstream circuit (user A) (a typical case of hydraulic counterweight or load balancing)

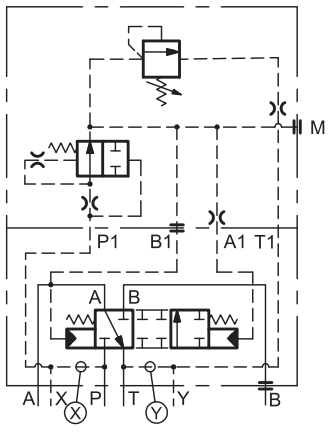
— They have a mounting surface in accordance with ISO 4401 (CETOP RP121H) standards. Port B is never used.

— They are available in three different sizes for flow rates up to 500 l/min.

PERFORMANCES (obtained with mineral oil with viscosity of 36 cSt at 50°C)

		DZC5 DZC5R	DZC7	DZC8
Maximum operating pressure:	bar	350		
Maximum flow	l/min	150	300	500
Ambient temperature range	°C	-20 / +50		
Fluid temperature range	°C	-20 / +80		
Fluid viscosity range	cSt	10 ÷ 400		
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15			
Recommended viscosity	cSt	25		
Mass:	kg	6,5	8,7	15

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

D	Z	C		-		/	10		-			/	

Balancing valve

Nominal size:
5 = CETOP P05 (**NOTE**)
5R = ISO 4401-05 (CETOP R05)
7 = ISO 4401-07 (CETOP 07)
8 = ISO 4401-08 (CETOP 08))

Pressure control range
070 = 0 ÷ 70 bar
140 = 0 ÷ 140 bar
210 = 0 ÷ 210 bar

Series No. (the overall and mounting dimensions remain unchanged from 10 to 19)

NOTE: This version is interchangeable with the previous model ZC4 Duplomatic

K1= Adjustment knob (omit for adjustment with countersunk hex screw)

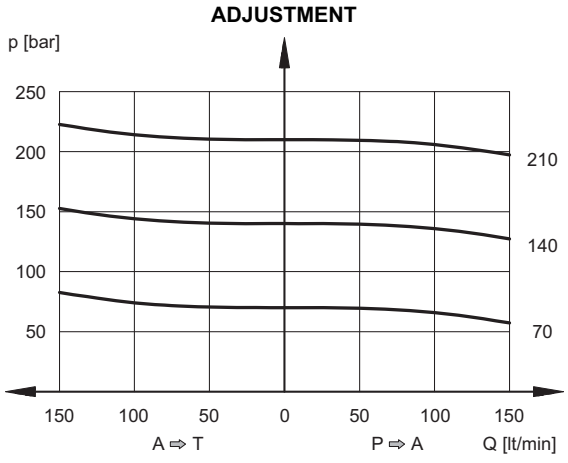
Drainage: **I** = internal
E = external

Piloting: **I** = internal
E = external

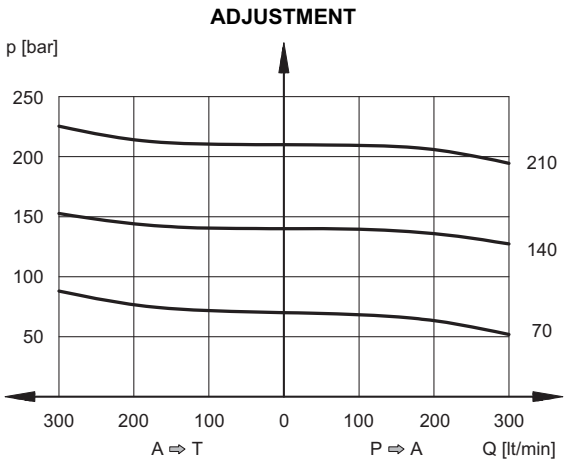
Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

3 - CHARACTERISTIC CURVES (obtained with mineral oil with viscosity of 36 cSt at 50°C and electronic control cards)

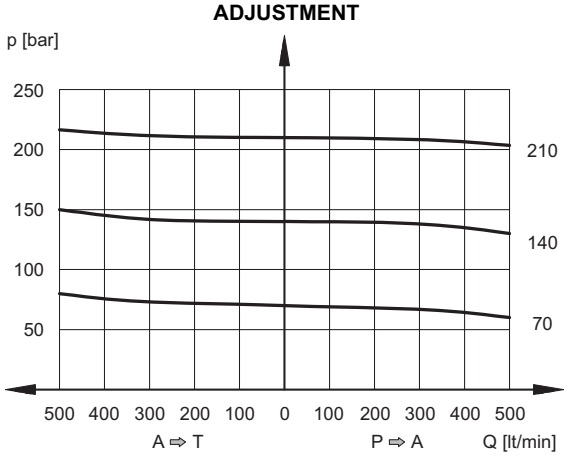
2.1 - Characteristic curves DZC5 and DZC5R



2.2 - Characteristic curves DZC7



2.3 - Characteristic curves DZC8



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.
The fluid must be preserved in its physical and chemical characteristics.

4 - PILOTING AND DRAINAGE

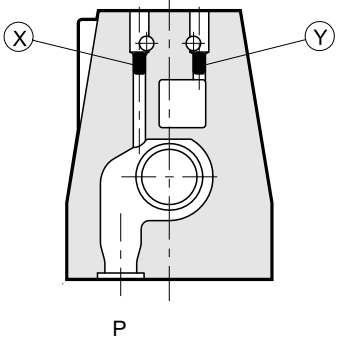
The DZC* valves are available with piloting and drainage, both internal and external.
We suggest to use the version with external drainage that allows a higher backpressure on the unloading.

VALVE TYPE		Plug assembly	
		X	**Y**
IE	INTERNAL PILOT AND EXTERNAL DRAIN	NO	YES
II	INTERNAL PILOT AND INTERNAL DRAIN	NO	NO
EE	EXTERNAL PILOT AND EXTERNAL DRAIN	YES	YES
EI	EXTERNAL PILOT AND INTERNAL DRAIN	YES	NO

PRESSURES (bar)

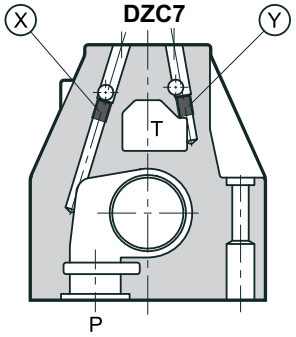
Pressure	MIN	MAX
Piloting pressure on X port	30	210
Pressure on T port with interal drain	–	2
Pressure on T port with external drain	–	250

DZC5 and DZC5R



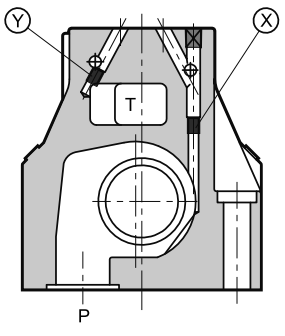
X: M5x6 plug for external pilot
Y: M5x6 plug for external drain

DZC7



X: M6x8 plug for external pilot
Y: M6x8 plug for external drain

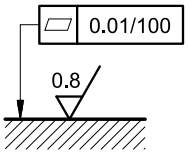
DZC8



X: M6x8 plug for external pilot
Y: M6x8 plug for external drain

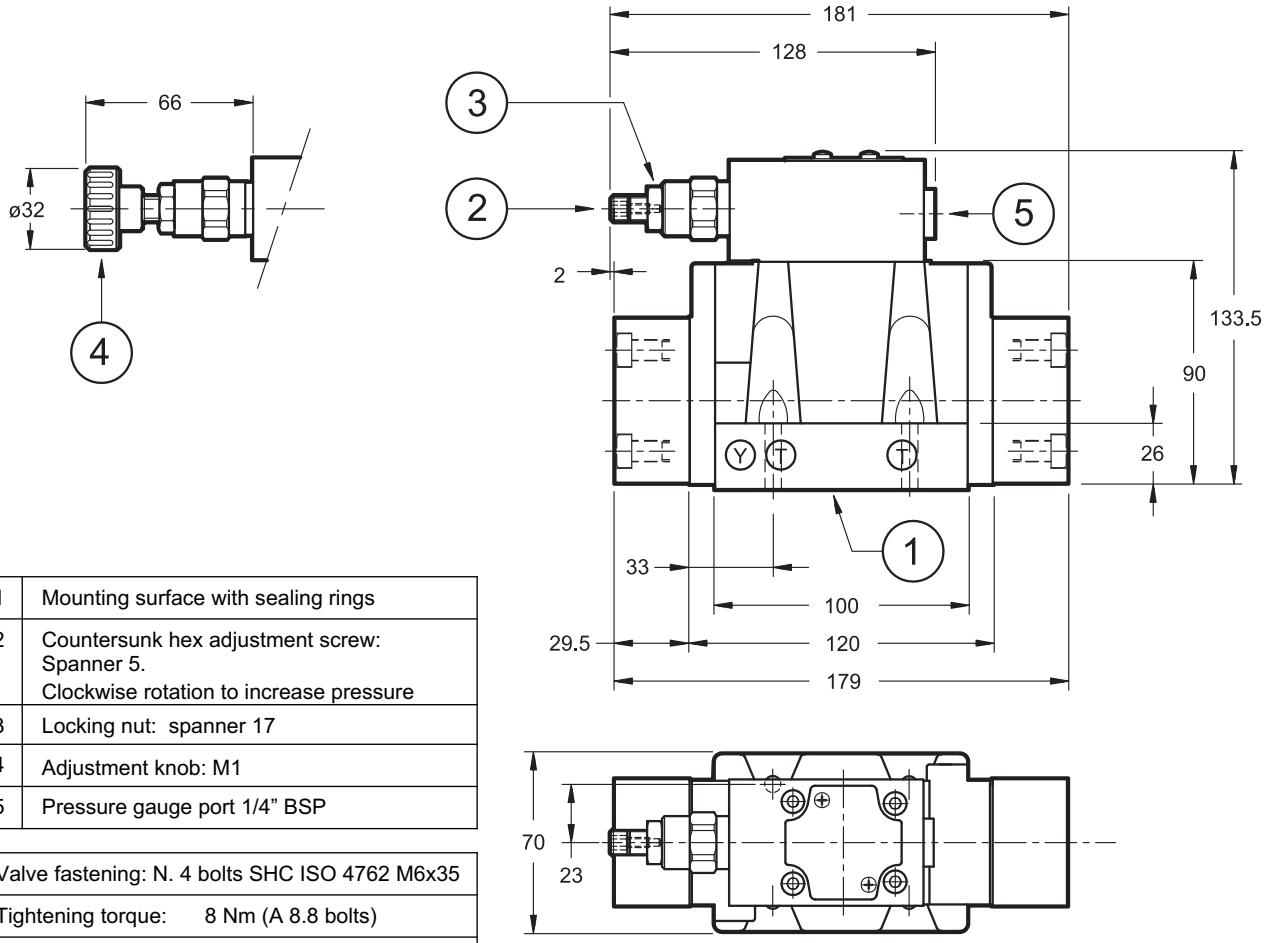
5 - INSTALLATION

The DZC* valves can be installed in any position without impairing correct operation.
Connect the valve T port directly to the tank. Add any backpressure value detected in the T line to the controlled pressure value. Maximum admissible backpressure in the T line, under operational conditions, is 2 bar. Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.



6 - DZC5 AND DZC5R OVERALL AND MOUNTING DIMENSIONS

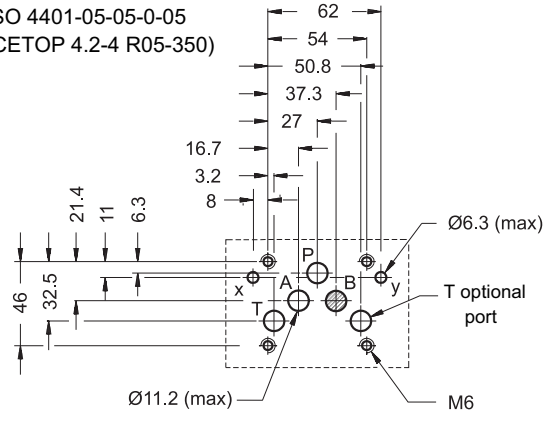
dimensions in mm



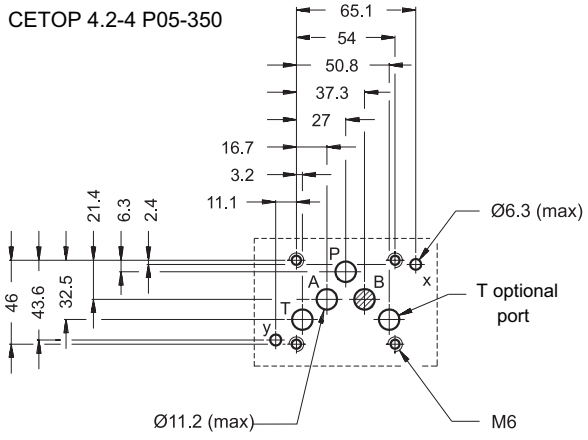
1	Mounting surface with sealing rings
2	Countersunk hex adjustment screw: Spanner 5. Clockwise rotation to increase pressure
3	Locking nut: spanner 17
4	Adjustment knob: M1
5	Pressure gauge port 1/4" BSP

Valve fastening: N. 4 bolts SHC ISO 4762 M6x35
Tightening torque: 8 Nm (A 8.8 bolts)
Thread of mounting holes: M6x10
Sealing rings: N. 5 OR type 2050 (12.42x1.78) - 90 Shore N. 2 OR type 2037 (9.25x1.78) - 90 Shore

DZC5R MOUNTING SURFACE
ISO 4401-05-05-0-05
(CETOP 4.2-4 R05-350)

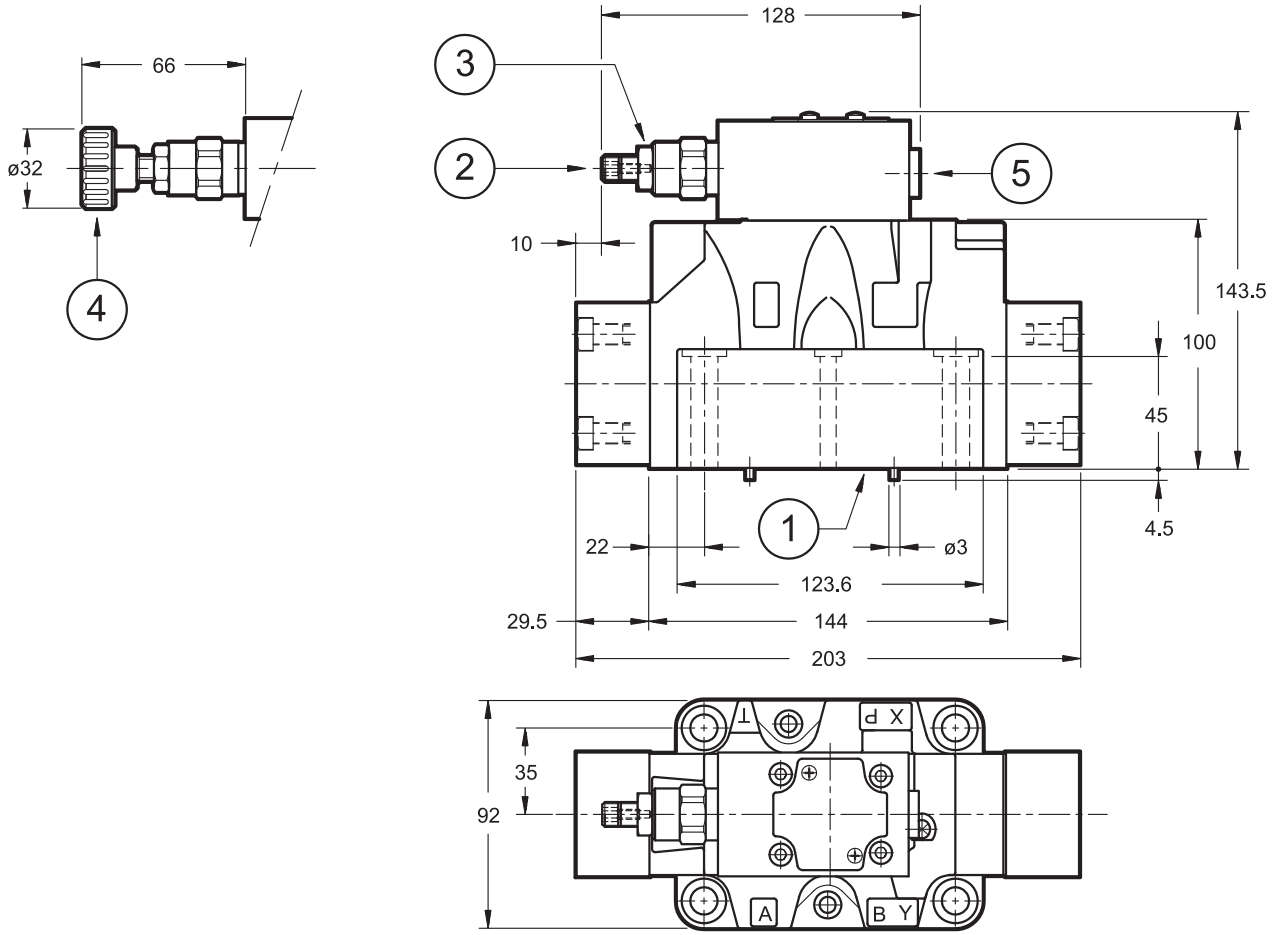


DZC5 MOUNTING SURFACE
CETOP 4.2-4 P05-350



7 - DZC7 OVERALL AND MOUNTING DIMENSIONS

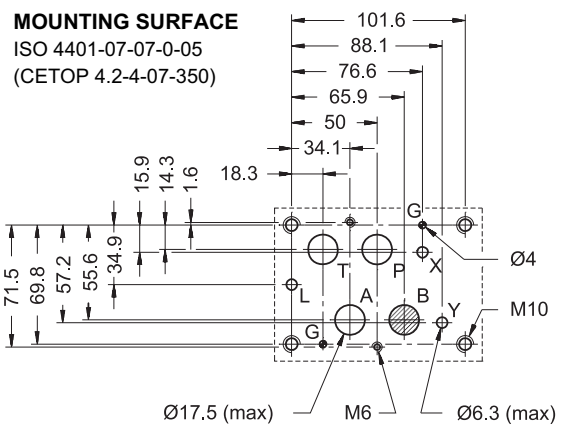
dimensions in mm



1	Mounting surface with sealing rings
2	Countersunk hex adjustment screw: Spanner 5. Clockwise rotation to increase pressure
3	Locking nut: spanner 17
4	Adjustment knob: M1
5	Pressure gauge port 1/4" BSP

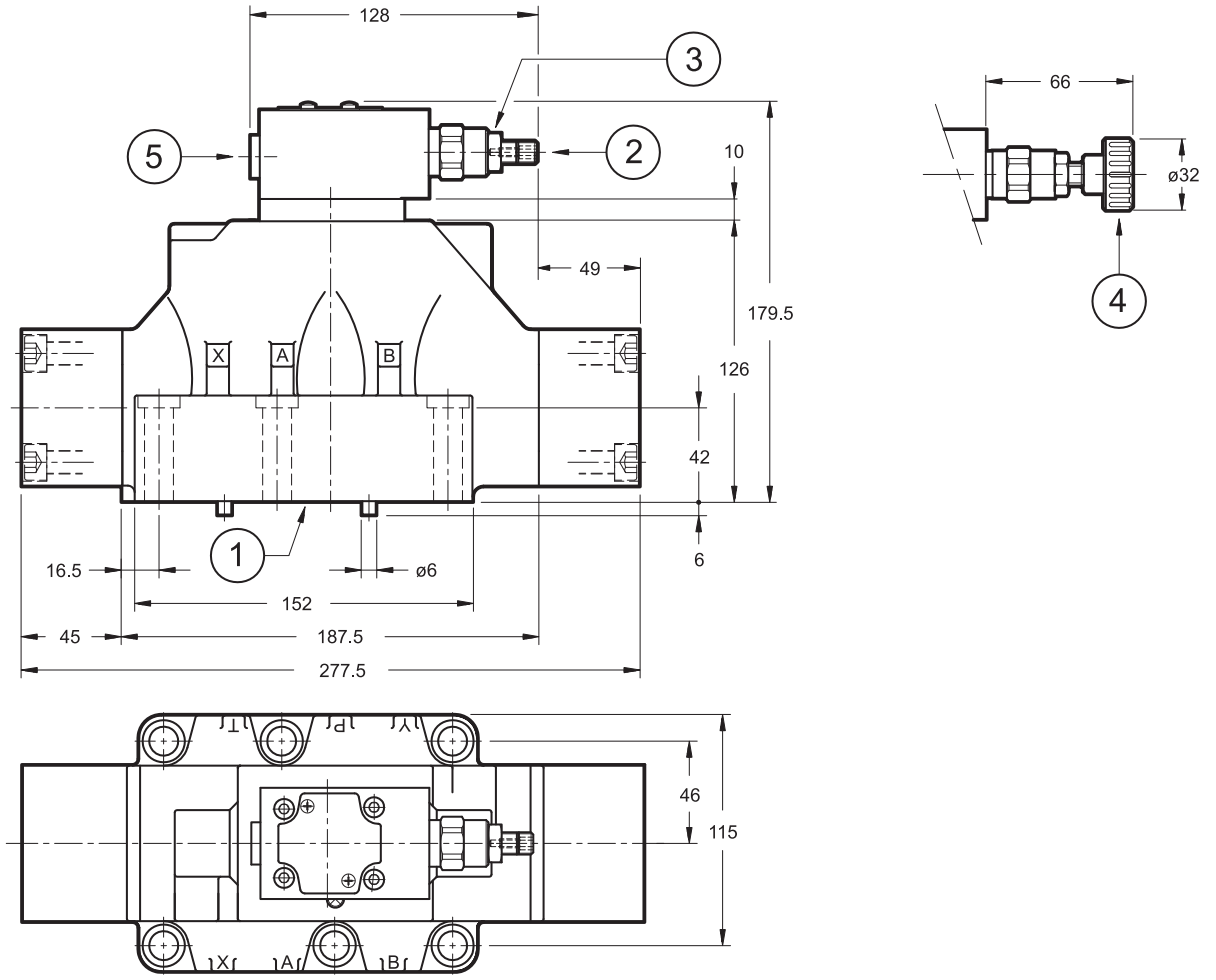
Single valve fastening:	N. 4 SHC ISO 4762 M10x60 bolts N. 2 SHC ISO 4762 M6x60 bolts
Tightening torque M10x60: 40 Nm (A 8.8 bolts) M6x60: 8 Nm (A 8.8 bolts)	
Thread of mounting holes:	M6x18; M10x18
Sealing rings:	N. 4 OR type 130 (22.22x2.62) - 90 Shore N. 2 OR type 2043 (10.82x1.78) - 90 Shore

MOUNTING SURFACE
ISO 4401-07-07-0-05
(CETOP 4.2-4-07-350)



8 - DZC8 OVERALL AND MOUNTING DIMENSIONS

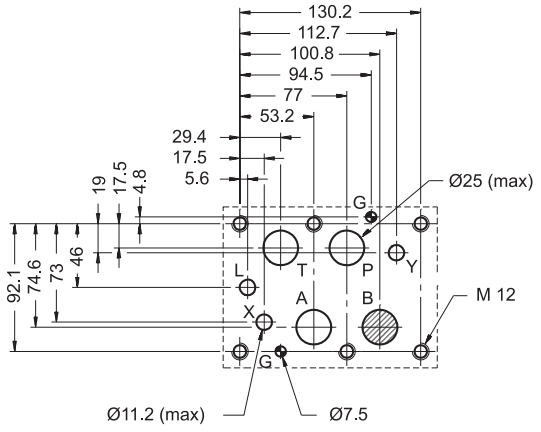
dimensions in mm



1	Mounting surface with sealing rings
2	Countersunk hex adjustment screw: Spanner 5. Clockwise rotation to increase pressure
3	Locking nut: spanner 17
4	Adjustment knob: M1
5	Pressure gauge port 1/4" BSP

Valve fastening: N. 6 SHC ISO 4762 M12x60 bolts
Tightening torque: 69 Nm (A 8.8 bolts)
Thread of mounting holes: M12x20
Sealing rings: N. 4 OR type 3118 (29.82x2.62) - 90 Shore N: 2 OR type 3081 (20.24x2.62) - 90 Shore

MOUNTING SURFACE
ISO 4401-08-08-0-05
(CETOP 4.2-4-08-350)



9 - SUBPLATES (See catalogue 51 000)

		DZC5	DZC7	DZC8
Model with rear ports		PME4-AI5G	PME07-AI6G	
Model with side ports		PME4-AL5G	PME07-AL6G	PME5-AL8G
Thread of ports:	P - T - A - B X - Y	3/4" BSP 1/4" BSP	1" BSP 1/4" BSP	1½" BSP 1/4" BSP

DUPLOMATIC OLEODINAMICA

DUPLOMATIC OLEODINAMICA S.p.A.
20015 PARABIAGO (MI) • Via M. Re Depaolini 24
Tel. +39 0331.895.111
Fax +39 0331.895.339
www.duplomatic.com • e-mail: sales.exp@duplomatic.com