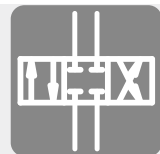


Valve bank type BNG

Product documentation



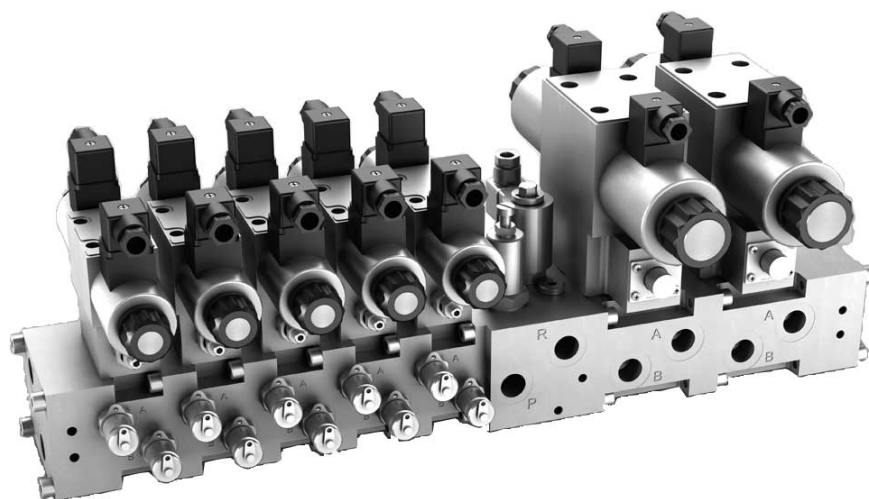
Manifold mounting

Operating pressure p_{\max} :

400 bar

Flow rate Q_{\max} :

60 lpm



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1 Overview of valve bank type BNG

A valve bank combines different valves for operating independent consumers. The directional valve bank type BNG consists of several valve sections, which are based on sub-plates. They can be used to flexibly assemble compact hydraulic manifolds.

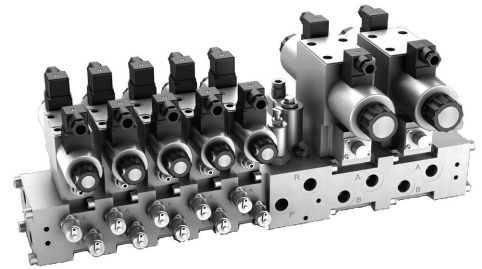
The valve bank type BNG can be flange-mounted directly on the hydraulic power packs.

Features and benefits:

- Sub-plates for flexible combination of directional valve types with NG 6 standard connection pattern
- Flange mount the valve bank directly onto the connection block of a hydraulic power pack. Can also be used as a separately arranged valve bank for the pipe connection

Intended applications:

- Clamping systems on machine tools and equipment
- Process control on deforming machine tools



Valve bank type BNG

2 Available versions, main data

2.1 Order coding, overview

Order coding example:

BNG 2	E 33 L	NBVP 16 S NBVP 16 G B0,8R/ABR2,0/BBR1,5/A3B9/400/S NSWP 2 G B0,6R/ABR1,0/BBR1,5/50/S	/22 /22 /22	/RK 3 /A1 B1 HFC	- E O R	- G 24	
							Solenoid voltage Table 3a Solenoid voltage
							End plate Table 6 End plate
							Additional elements at P and port assignment for A and B Table 2a Additional elements at P Table 4a Port assignment for A and B
							Sub-plate Table 4 Sub-plate
							Directional valves and intermediate plates Table 3 Directional valves Table 5 Intermediate plates
							Connection block and additional elements at P Table 2 Connection block Table 2a Additional elements at P
							Basic type and size Table 1 Basic type and size

2.2 Input section

Table 1 Basic type and size

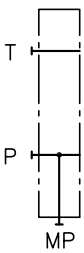
Basic type and size	Description	Flow rate Q_{max} (lpm)	Pressure p_{max} (bar)
BNG 2	For directional valves NG 6 (ISO 4401)	60	400

Table 2 Connection block

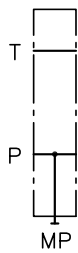
Coding	Description	Port (BSPP) P, T
No designation	No connection block in the event of direct mounting on the hydraulic power pack	--
E 33 LX	Terminator, ports sealed	G 1/2
E 33 L	Series, port P and T	G 1/2
E 33 L2	2x port P and T, optional check valve or orifice at P (Table 2a)	G 1/2

Circuit symbols

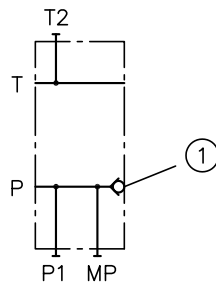
E 33 LX



E 33 L



E 33 L2



1 Optional check valve or restrictor (Table 2a)

Table 2a Additional elements at P

Coding	Description	Circuit symbol
No designation	None	
RK 3	Check valve type RK 3 (D 7445)	
B 0,8 B 2,5 B 3,0 B 3,5 B 4,0	Orifice with orifice diameter	
B 0	Seal	

2.3 Valve sections

2.3.1 Directional valves and sub-plates

Table 3 Directional valve


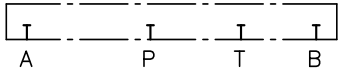
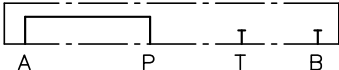
Coding	Description	Flow rate Q_{max} (lpm)	Pressure p_{max} (bar)	Publication
Directional valves NG 6, suitable for type BNG 2				
Combination with intermediate plates type NZP in accordance with D 7788 Z possible				
NSWP 2	3/2, 3/3, 4/2 and 4/3 directional spool valve with additional options (pressure monitoring, restrictors and restrictor check valves in the ports)	25	315	D 7451 N
SWPN 2	3/3 and 4/3 directional spool valve	60	350	D 7451 AT
NSMD 2	Clamping module (combination of 4/2 or 4/3 directional spool valve, pressure reducing valve and tracked pressure switch)	25	100	D 7787
NBVP 16	2/2, 3/2 and 4/3 directional seated valves	20	400	D 7765 N
	 Note In contrast to the designation of a single valve as per D 7765 N , a coding for actuation must also be specified (M solenoid - 400 bar; GM solenoid - 250 bar; H - hydraulic; P - pneumatic; A - hand lever)			
NBMD 16	Brake module (combination of directional seated valves and preloaded reflux)	20	400	Sk 7983
NPMVP	Proportional pressure-limiting valve	16	(500)	D 7485 N
NG 6X	Reactive plate (for subsequent installation of a directional valve)			
NG 6X PA	Reactive plate with short circuit connection from P to A			
Pressure reducing valve in P gallery, suitable for type BNG 2				
ADM 33 P	Pressure reducing valve	60	320	D 7120

Table 3a Solenoid voltage

Coding	Electrical connection	Nominal voltage	Protection class (IEC 60529)
X 12	DIN EN 175 301-803 A (Coding G... with line connector, coding L... with LED plug) (Coding WG with alternating rectifier in line connector)	12 V DC	IP 65
X 24		24 V DC	
X 48		48 V DC	
X 98		98 V DC	
X 205		205 V DC	
WG 110		110 V AC 50/60 Hz	
WG 230		230 V AC 50/60 Hz	



Note

- The availability of additional solenoid voltages and solenoid versions is based on the directional valves used.
- The solenoid voltages and solenoid versions are specified at the end of the valve bank and this applies to all solenoids.
- The specifications regarding the IP protection class apply for versions featuring a properly assembled line connector.

Electrical connection for actuating solenoid

G .., X .., L .. (WG)

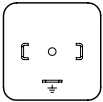
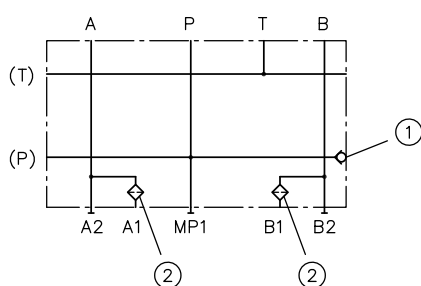
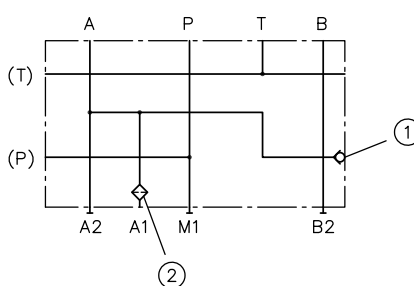
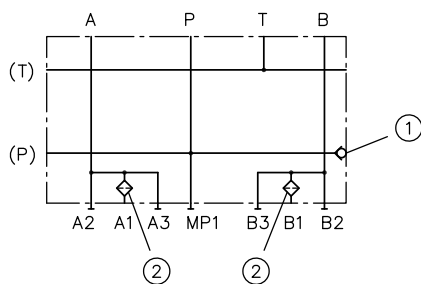
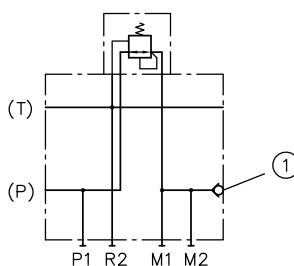


Table 4 Sub-plates

Coding	Description	Port (BSPP) A.., B..
22	Series, 2x A and B port, optional check valve or orifice at P (Table 2a), optional port assignment (Table 4a)	G 3/8
22 S	Series connection, 2x A and B port, the pressure resistance at port T of the directional valve must be considered, optional check valve or orifice at P (Table 2a), optional port assignment (Table 4a)	G 3/8
222	Series, 3x A and B port, optional check valve or orifice at P (Table 2a), optional port assignment (Table 4a)	G 3/8
32 /ADM 33 P	Pressure reducing valve type ADM 33 P in the P gallery, optional check valve or orifice at P (Table 2a)	--

Circuit symbols
22

22 S

222

32 /ADM 33 P


- 1 Optional check valve or restrictor (Table 2a)
- 2 Optional port assignment (Table 4a)

Table 4a Port assignment for A and B

Coding	Description	Circuit symbol
No designation	Ports A1 and B1 open; all other ports sealed	
/A2 B2	Ports A2 and B2 open; all other ports sealed	
/A1 B1 HFC	Filter elements type HFC 3/8 F (D 7235) in A1 and B1; all other ports sealed	
/A2 B2 HFC	Filter elements type HFC 3/8 F (D 7235) in A2 and B2; all other ports sealed	

2.3.2 Intermediate plates

Table 5 Intermediate plates

Coding	Description	Port (BSPP) P., T..
ZPL 2/33/X/MVE6...	Middle input block, port P or T, pressure-limiting valve (with pressure setting) type MVE6 (D 7000/1), optional check valve or orifice at P (Table 2a)	G 1/2
ZPL 2/33/S/MVE6...	Middle input block, port P or T, pressure-limiting valve (with pressure setting), idle circulation valve type EM 31 S (D 7490/1) normally open, optional check valve or orifice at P (Table 2a)	G 1/2
ZPL 2/33/V/MVE6...	Middle input block, port P or T, pressure-limiting valve (with pressure setting), idle circulation valve type EM 31 V (D 7490/1) normally closed, optional check valve or orifice at P (Table 2a)	G 1/2

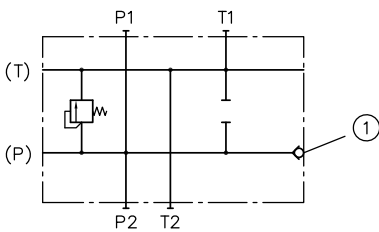


Note

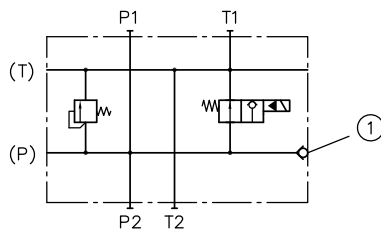
The solenoid voltage and solenoid version are specified at the end of the valve bank and this applies to all solenoids (Table 3a)

Circuit symbols

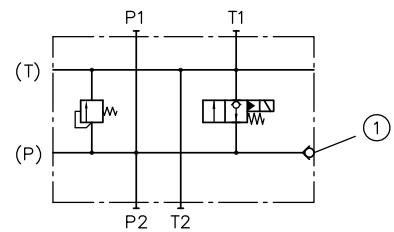
ZPL 2/33/X



ZPL 2/33/S



ZPL 2/33/V



1 Optional check valve or restrictor (Table 2a)

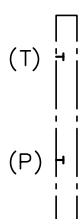
2.4 End plates

Table 6 End plates

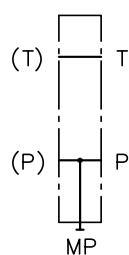
Coding	Description	Port (BSPP) P, T, S1, S2
E 0 R	Terminator	--
E 33 R	Port P and T	G 1/2
E 33 RA/CMV2...	S accumulator port, pressure-limiting valve (with pressure setting) type CMV 2 (D 7710 MV), drain valve, optional restrictor check valve (Table 6a)	G 3/8
E 33 RA/CMVX2...	S accumulator port, pressure-limiting valve with unit approval (with pressure setting) type CMVX 2 (D 7710 TUV), drain valve, optional restrictor check valve (Table 6a)	

Circuit symbols

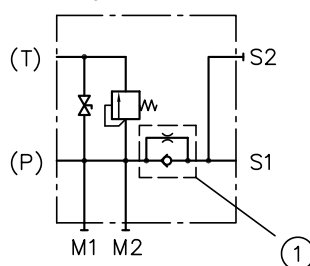
E 0 R



E 33 R



E 33 RA/CMV2...
E 33 RA/CMVX2...



1 Optional restrictor check valve (Table 6a)

Table 6a Restrictor check valve

Coding	Description	Circuit symbol
No designation	None	
BC 1 - 0,2 BC 1 - 0,4 BC 1 - 0,5 BC 1 - 0,6 BC 1 - 0,8 BC 1 - 1,0 BC 1 - 1,2	Restrictor check valve with orifice diameter (mm)	

General

Designation	Valve bank
Design	Segmental construction; up to 10 valve sections
Model	Manifold mounting
Material	DIN 50979-Fe ZnNi 8 Steel; valve housing galvanized zinc plated; hardened and ground functional inner parts
Attachment	See Chapter 4, "Dimensions"
Installation position	As desired
Ports	<p>P = Hydraulic oil inlets (pump) or hydraulic oil lead-on</p> <p>T, R = Return lines</p> <p>A, B = Consumer ports</p>
Hydraulic fluid	Hydraulic oil: according to DIN 51524-1 part 1 to 3; ISO VG 10 to 68 according to ISO 3448 Viscosity range: min. approx. 4; max. approx. 400 mm ² /s Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester).
Cleanliness level	ISO 4406 <u>21/18/15...19/17/13</u>
Temperatures	Environment: approx. -20 to +80°C, oil: -20 to +60°C, pay attention to the viscosity range. Start temperature: down to -40°C is permissible (observe start viscosities!), as long as the steady-state temperature is at least 20K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications.



Note

The specifications of the installed directional valves or preceding hydraulic power packs must be observed!

Weight

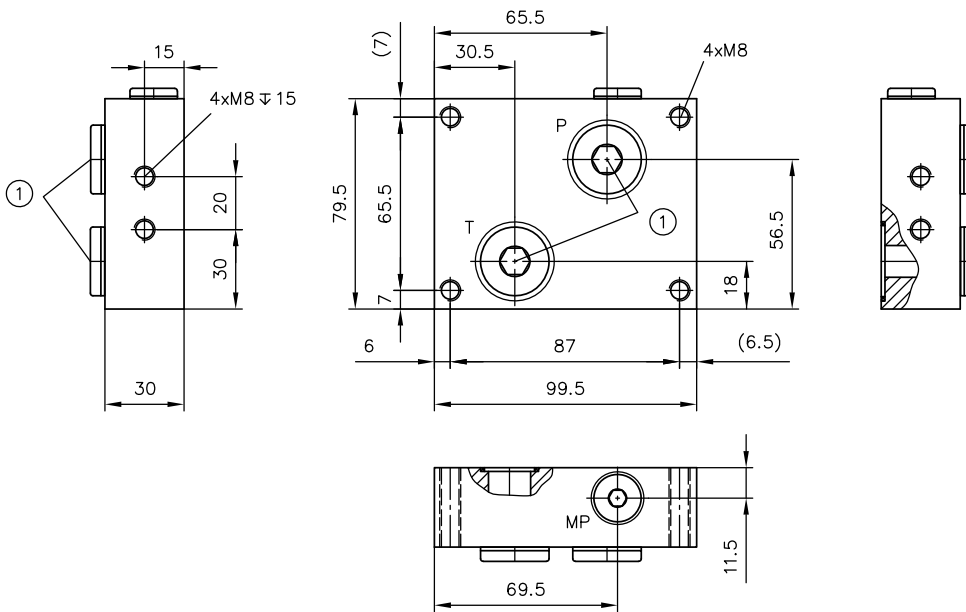
Connection block	Coding	
	E 33 L	= 1.6 kg
	E 33 L2	= 2.2 kg
	E 33 LX	= 1.6 kg
End plates	E 0 R	= 1.2 kg
	E 33 R	= 1.6 kg
	E 33 RA/...	= 2.6 kg
Sub-plates	22	= 2.7 kg
	22 S	= 2.7 kg
	222	= 2.6 kg
	32 /ADM 33 P	= 2.6 kg
Intermediate plates	ZPL 2/33/X	= 3.6 kg
	ZPL 2/33/S	= 3.6 kg
	ZPL 2/33/V	= 3.6 kg

4 Dimensions

All dimensions in mm, subject to change.

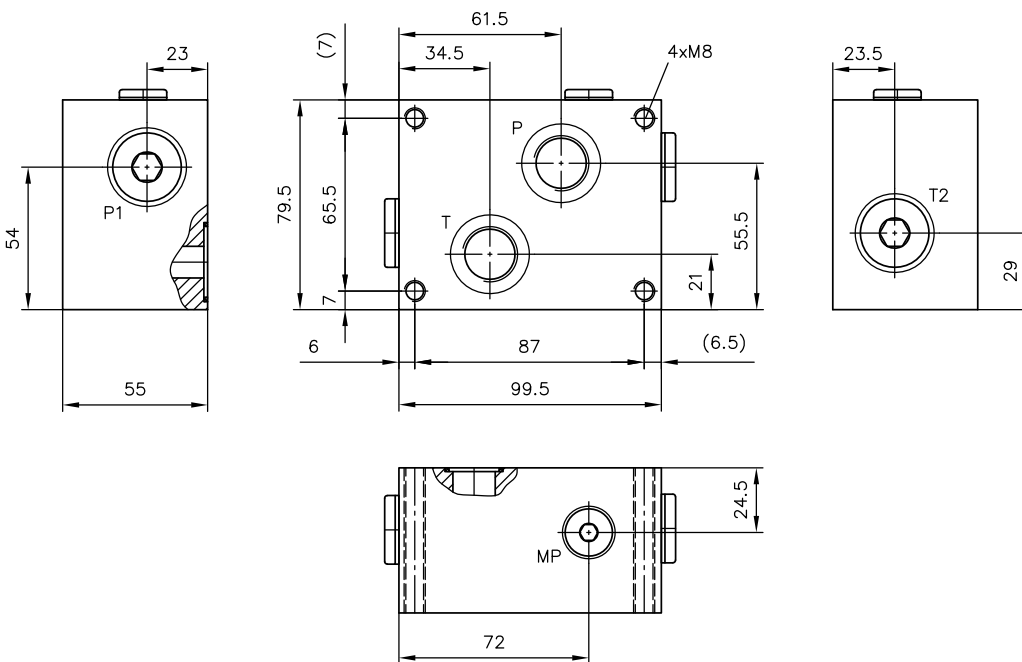
4.1 Connection block

Coding **E 33 L**, **E 33 LX**



1 Tapped plugs in type E 33 LX

Coding **E 33 L2**



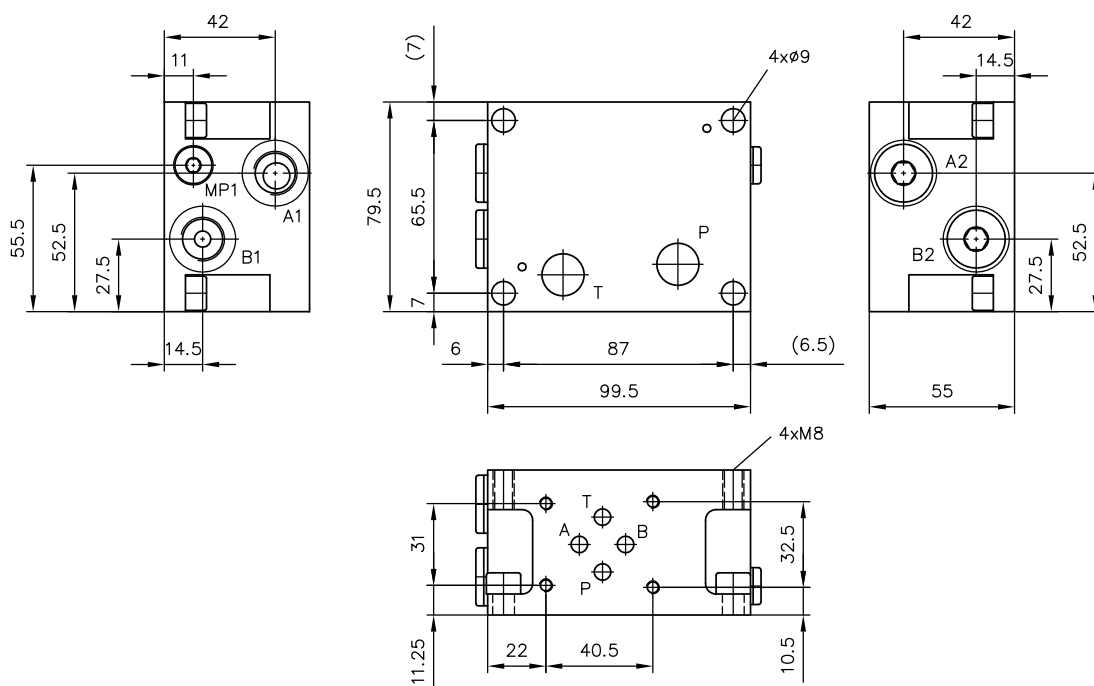
Port (ISO 228-1) (BSPP)

P, T, P1, T1	G 1/2
MP	G 1/4

4.2 Valve sections

4.2.1 Sub-plates

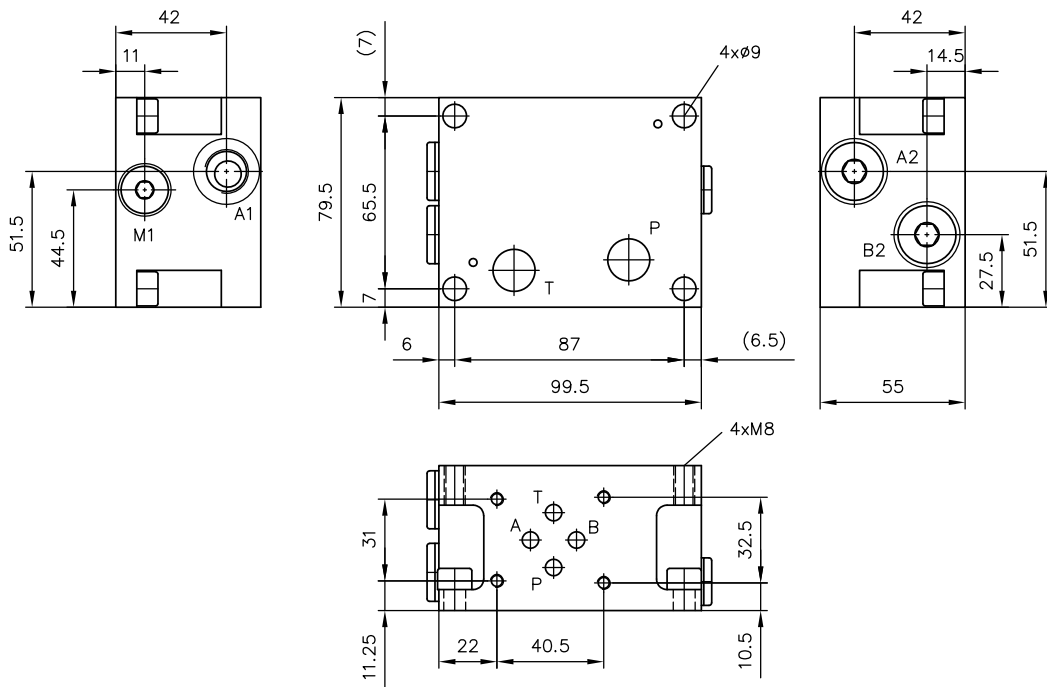
Coding 22



Port (ISO 228-1) (BSPP)

A1, A2	G 3/8
B1, B2	G 3/8
MP1	G 1/8

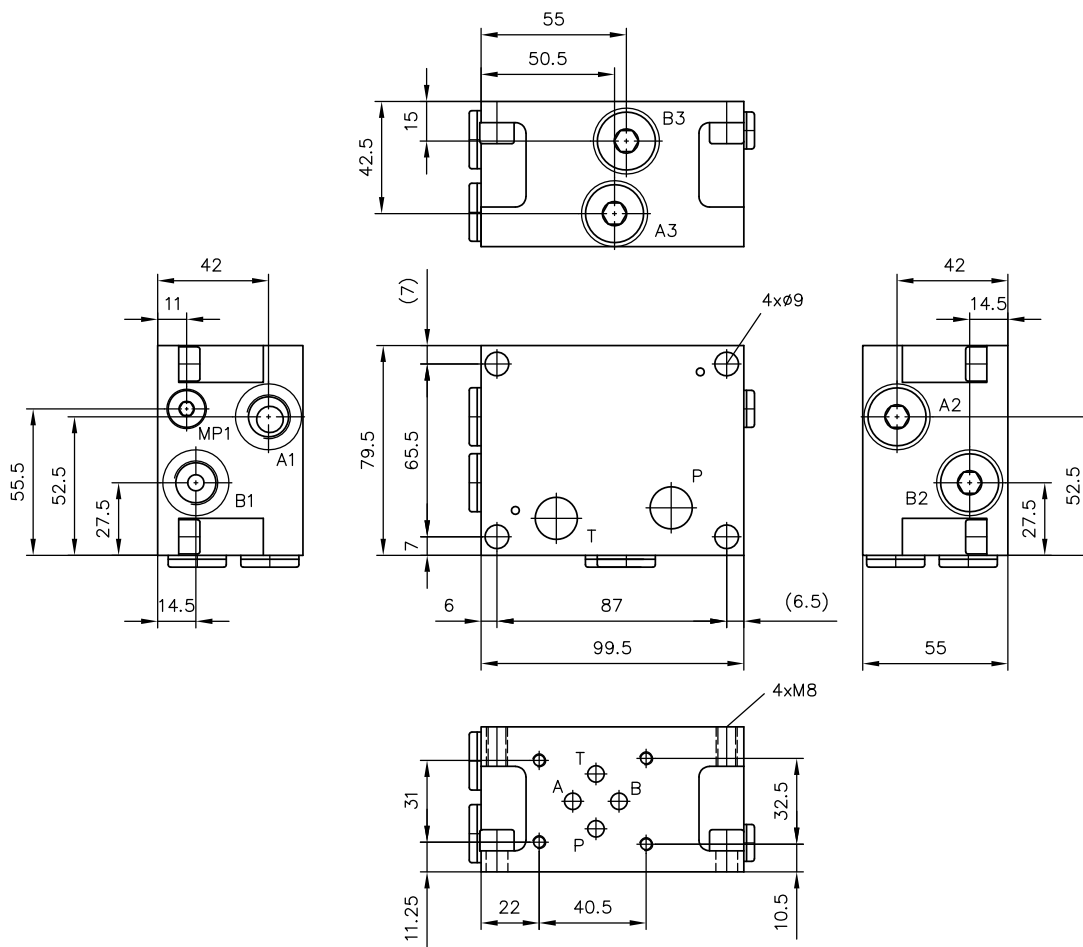
Coding 22 S



Port (ISO 228-1) (BSPP)

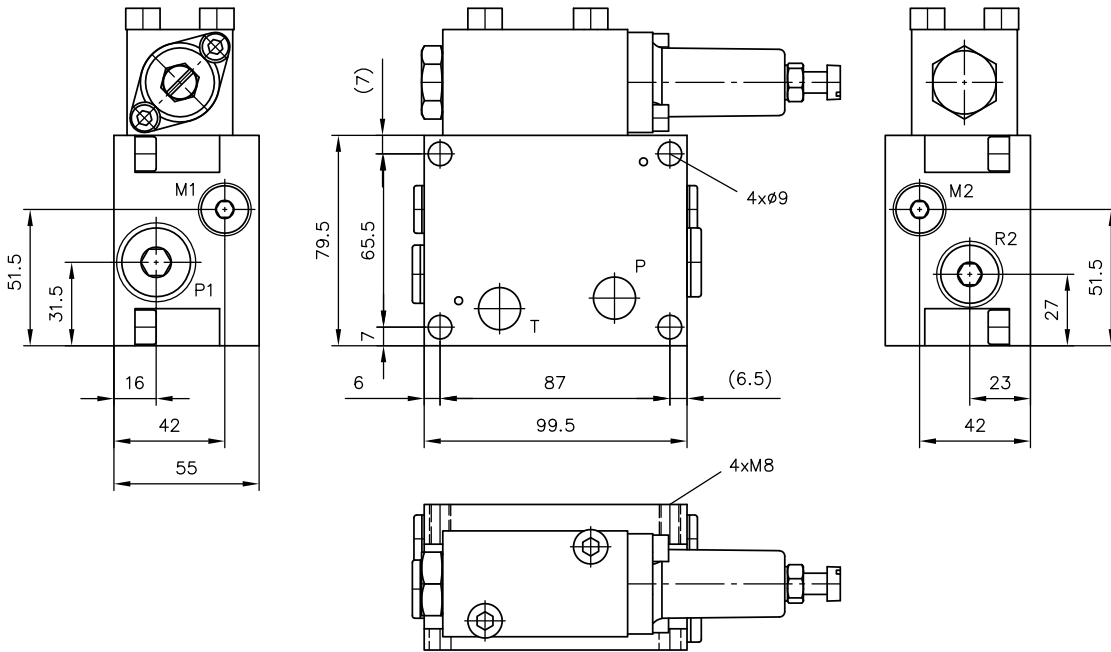
A1, A2, B2	G 3/8
M1	G 1/4

Coding 222



Port (ISO 228-1) (BSPP)

A1, A2, A3	G 3/8
B1, B2, B3	G 3/8
MP1	G 1/8

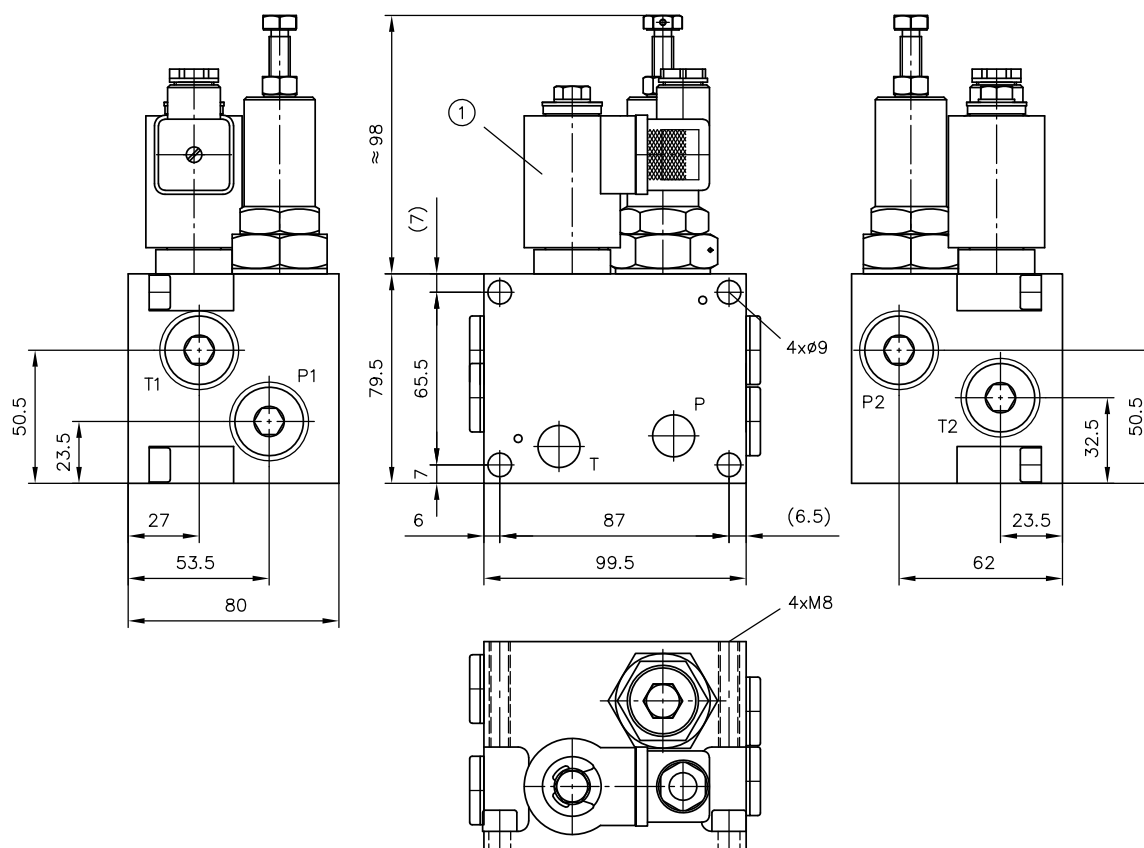


Port (ISO 228-1) (BSPP)

P1	G 1/2
R2	G 3/8
M1, M2	G 1/4

4.2.2 Intermediate plates

Coding ZPL 2/33/X, ZPL 2/33/S, ZPL 2/33/V



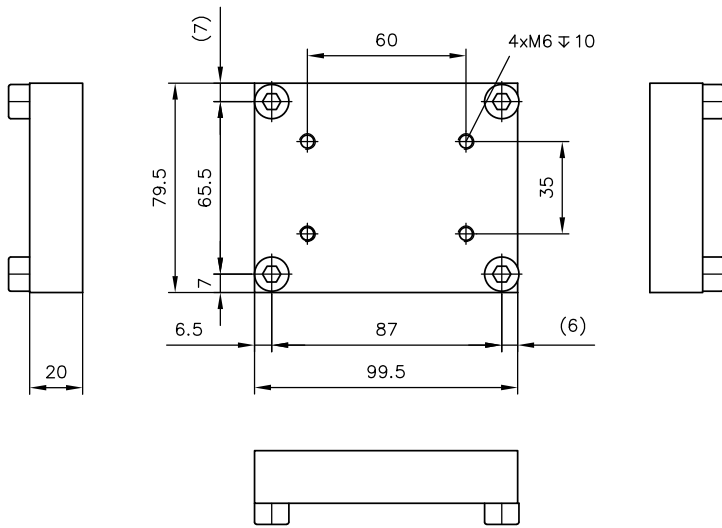
1 Idle circulation valve in type ZPL 2/33/S and ZPL 2/33/V

Port (ISO 228-1) (BSPP)

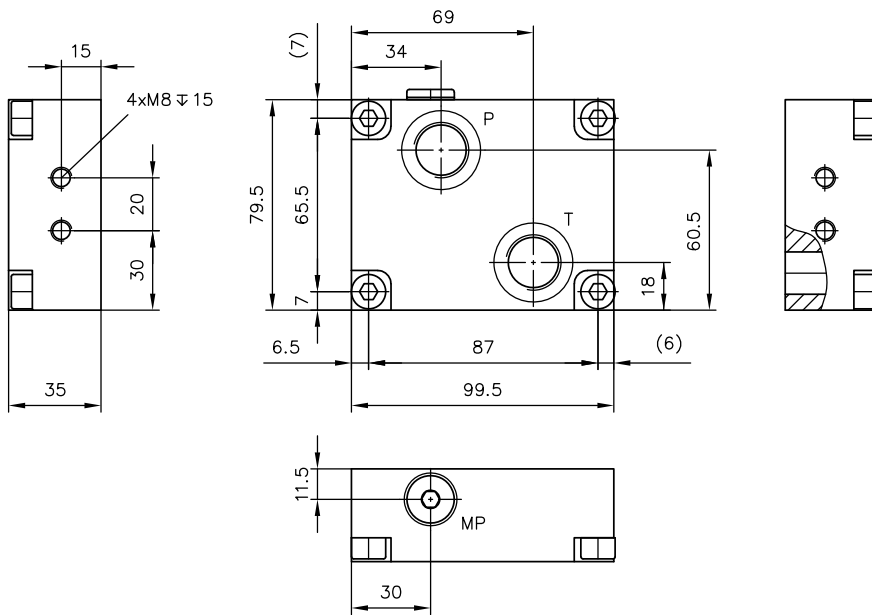
P1, P2 T1, T2	G 1/2
------------------	-------

4.3 End plates

Coding **E 0 R**



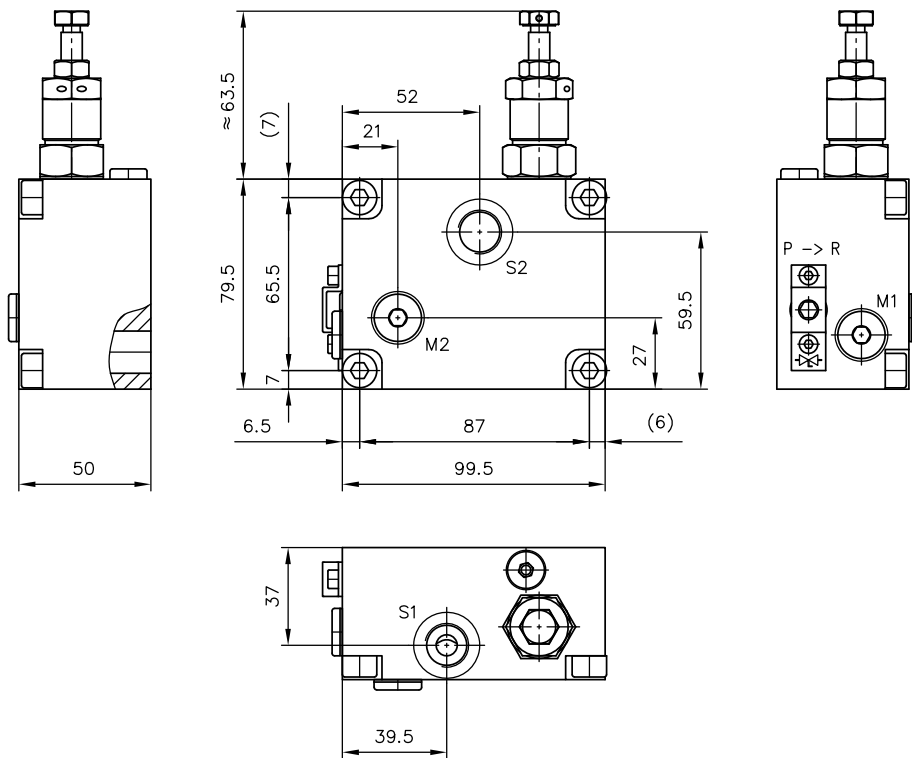
Coding **E 33 R**



Port (ISO 228-1) (BSPP)

P, T	G 1/2
MP	G 1/4

Coding E 33 RA/CMV2..., E 33 RA/CMVX2...



Port (ISO 228-1) (BSPP)

S1, S2	G 3/8
M1, M2	G 1/4

5.1 Intended use

This valve is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this documentation.

Essential requirements for the product to function correctly and safely:

- All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- The product must only be assembled and put into operation by qualified personnel.
- The product must only be operated within the specified technical parameters. The technical parameters are described in detail in this documentation.
- The operating and maintenance manual of the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Take the product out of operation and mark it accordingly.
- ✓ It is then not permitted to continue using or operating the product.

**5.2 Assembly information**

The valve bank must only be installed in the complete system with standard and compliant connection components (fittings, hoses, pipes, fixtures, etc.).

**Danger**

Risk to life caused by sudden movement of the hydraulic drives when dismantled incorrectly!

Risk of serious injury or death.

- Depressurise the hydraulic system.
- Perform safety measures in preparation for maintenance.

5.3 Operating instructions

Product configuration and setting the pressure and flow rate

The statements and technical parameters in this documentation must be strictly observed.
The instructions for the complete technical system must also always be followed.

Note

- Read the documentation carefully before usage.
- The documentation must be accessible to the operating and maintenance staff at all times.
- Keep documentation up to date after every addition or update.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the hydraulic component. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Metal chips
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

Note

Fresh hydraulic fluid from the drum does not always have the highest degree of purity. Under some circumstances the fresh hydraulic fluid must be filtered before use.

Pay attention to the cleanliness level of the hydraulic fluid in order to maintain faultless operation.
(Also see cleanliness level in [Chapter 3, "Parameters"](#).)

5.4 Maintenance information

This product is largely maintenance-free.

Conduct a visual inspection at regular intervals, but at least once per year, to check if the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

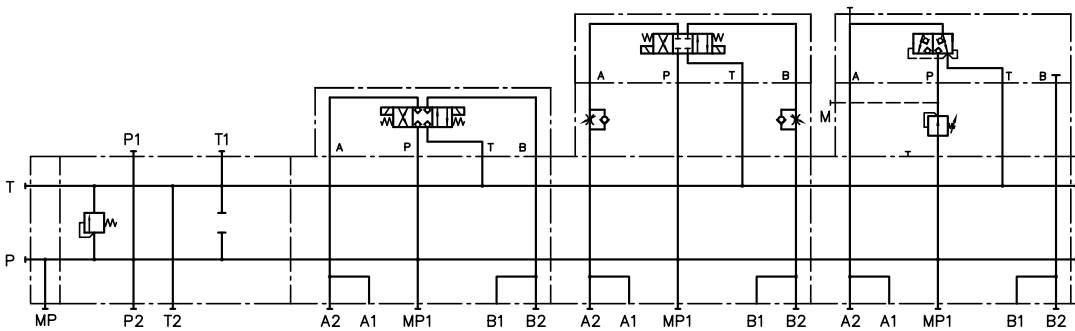
Clean the device surface of dust deposits and dirt at regular intervals, but at least once per year.

6 Other information

6.1 Circuit example

BNG 2

- E 33 LX
- ZPL 2/33/X/MVE6C315
- NBVP 16 G/M/22
- SWPN 2 G/NZP 16 Q33/22
- NBVP 16 Z/2/M/NZP 16 CZ2/180/22
- E 0 R-X 24



6.2 Accessories, spare parts and separate components

Designation	Material number
Seal kit NBR	8750 0830-00
Screw kit ISO 4762 A2-70	
M8x20	8750 0840-00
M8x35	8750 0841-00
M8x50	8750 0843-00
Seal for cover plate assembly Abil N	8230 0174-00
Filter elements type HFC 3/8 F	7512 5005-00

Further information

Additional versions

- Clamping module type NSMD: D 7787
- Directional spool valve type NSWP 2: D 7451 N
- Directional spool valve type SWPN: D 7451 AT
- Directional seated valve type NBVP 16: D 7765 N
- Proportional pressure-limiting valve type NPMVP: D 7485 N
- Intermediate plate type NZP: D 7788 Z
- Pressure-reducing valve type ADM: D 7120
- All types of directional valves with connection pattern NG 6 in accordance with ISO 4401
- Valve bank (nominal size 6) type BA: D 7788
- Hydraulic power pack type FXU: D 6020