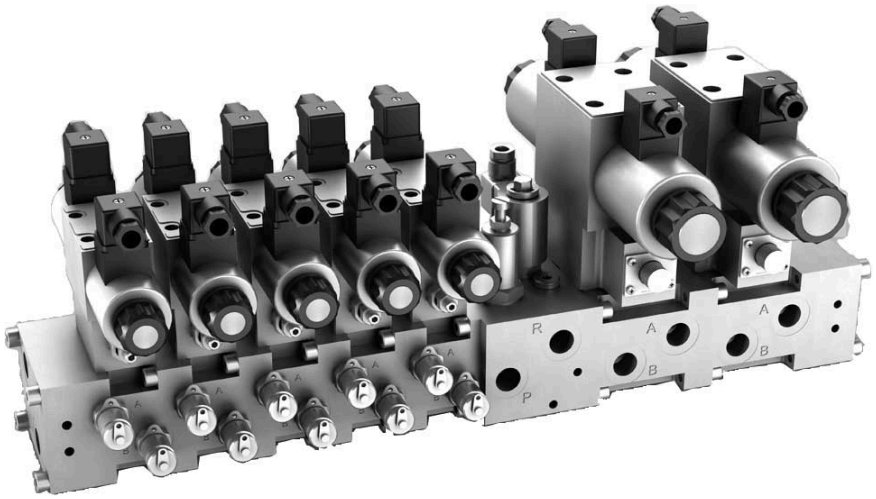
Valve bank type BNG

Product documentation

Manifold mounting

Operating pressure p_{max}:	400 bar
Flow rate Q_{max}:	80 l/min



D 7788 BNG
07-2021-1.1 en

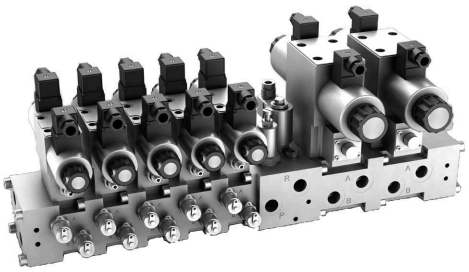
HAWE HYDRAULIK

© by HAWE Hydraulik SE.
The reproduction and distribution of this document as well as the use and communication of its contents to others without explicit authorisation is prohibited.
Offenders will be held liable for the payment of damages.
All rights reserved in the event of patent or utility model applications.
Brand names, product names and trademarks are not specifically indicated. In particular with regard to registered and protected names and trademarks, usage is subject to legal provisions.
HAWE Hydraulik respects these legal provisions in all cases.
Printing date / document generated on: 06.08.2021

Contents

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.



Valve bank type BNG

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

© HAWE Hydraulik SE

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 0 R	- G 24

- Solenoid voltage "Table 3a"
- End plate "Table 6"
- Additional elements at P and port assignment for A and B "Table 2a" "Table 4a"
- Sub-plate "Table 4"
- Directional valves and intermediate plates "Table 3" "Table 5"
- Connection block and additional elements at P "Table 2" "Table 2a"
- Basic type and size "Table 1"

2.2 Input section

Table 1 Basic type and size

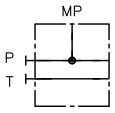
Type	Description	Flow rate Q_{max} (lpm)	Pressure p_{max} (bar)
BNG 2	For directional valves NG 6 (ISO 4401)	80	400

Table 2 Connection block

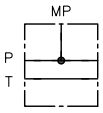
Coding	Description	Port (BSPP) P, T
Without coding	No connection block in the event of direct mounting on the hydraulic power pack	--
E 33 LX	Terminator, ports sealed	G 1/2
E 33 L	Series, port P and T	G 1/2
E 33 L2	2x P port and T port, optional check valve or orifice at P ("Table 2a")	G 1/2

Circuit symbols

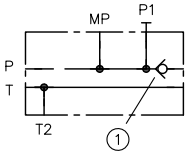
E 33 LX



E 33 L



E 33 L2



1 Optional check valve or restrictor ("Table 2a")

Table 2a Additional elements at P

Coding	Description	Circuit symbol
Without coding	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	

 © HAWE Hydraulik SE

2.3 Valve sections

2.3.1 Directional valves and sub-plates

Table 3 Directional valve

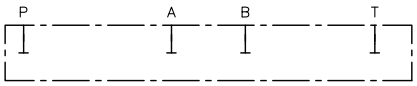
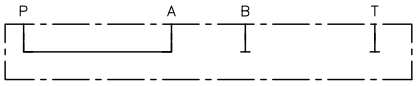
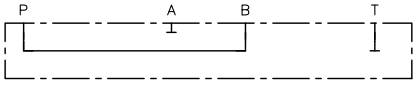
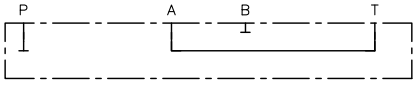
Coding	Description	Flow rate Q_{max} (lpm)	Pressure p_{max} (bar)	Publication
Directional valves NG 6, suitable for type BNG 2 Can be combined with intermediate plates type NZP in accordance with D 7788 Z				
NSWP 2	3/2, 3/3, 4/2 and 4/3 directional spool valve with additional options (pressure monitoring, restrictors and restrictor check valves in the ports)	25	315	D 7451 N
SWPN 2	3/3 and 4/3 directional spool valve	80	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 **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)	20	400	D 7765 N
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			
NG 6X PB	Reactive plate with short circuit connection from P to B			
NG 6X AT	Reactive plate with connection from A to T			
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

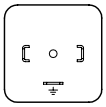
Coding	Electrical connection	Nominal voltage	Protection class (IEC 60529)
X 12	DIN EN 175 301-803 A	12 V DC	
X 24	(Coding G... with line connector, coding L... with LED plug)	24 V DC	
X 48	(Coding WG with alternating rectifier in line connector)	48 V DC	
X 98		98 V DC	IP 65
X 205		205 V DC	
WG 110		110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



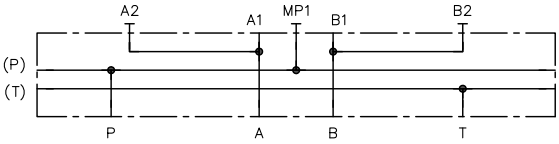
© HAWE Hydraulik SE

Table 4 Sub-plates

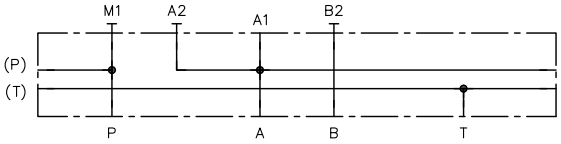
Coding	Description	Port (BSPP) A.., B..
22	Series, 2x A and B port, optional check valve or orifice at P ("Table 2a"), optional port assignment ("Table 4a")	G 3/8
22 S	Series connection, 2x A port and B port, the pressure resistance at the T port of the directional valve must be considered, optional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

Circuit symbols

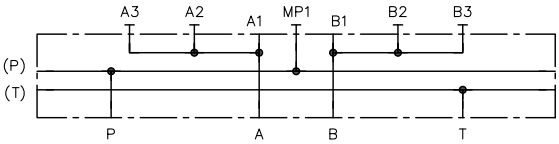
22



22 S



222



32 /ADM 33 P

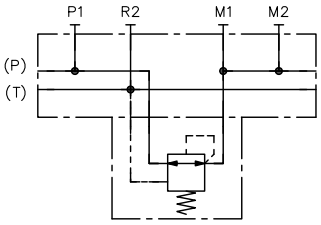


Table 4a Port assignment for A and B

Coding	Description	Circuit symbol
Without coding	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

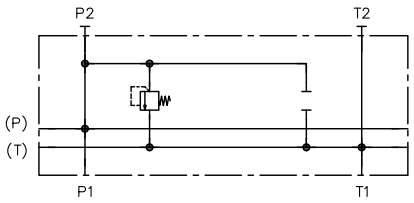
Coding	Description	Port (BSPP) P.., T..
ZPL 2/33/X/MVE6...	Middle input block, P port or T port, pressure-limiting valve (with pressure setting) type MVE6 (D 7000/1), optional check valve or orifice at P ("Table 2a")	G 1/2
ZPL 2/33/S/MVE6...	Middle input block, P port or T port, pressure-limiting valve (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, P port or T port, 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

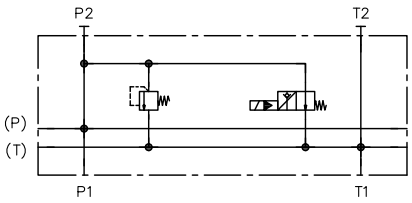
The solenoid voltage and solenoid version are specified at the end of the valve bank and this applies to all solenoids ("Table 3a")

Circuit symbols

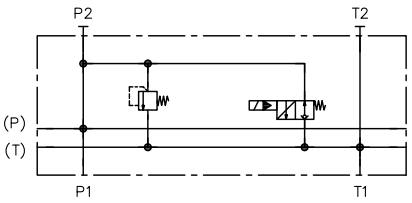
ZPL 2/33/X



ZPL 2/33/S



ZPL 2/33/V



 © HAWE Hydraulik SE

2.4 End plates

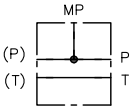
Table 6 End plates

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	G 1/2
E 33 RA/CMVX2...	S accumulator port, component approved pressure-limiting valve (with pressure setting) type CMVX 2 (D 7710 TUV), drain valve, optional restrictor check valve ("Table 6a")	--	G 3/8	G 1/2
E 33 RA/X	S accumulator port, prepared for CMV 2 or CMVX 2 (blocked), drain valve, optional restrictor check valve ("Table 6a")	G 3/8	G 3/8	G 1/2

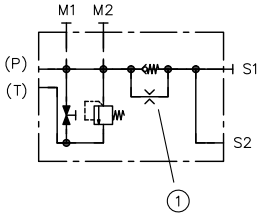
Circuit symbols

E 0 R

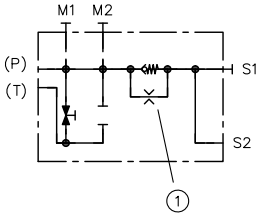
E 33 R



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



E 33 RA/X



1 optional restrictor check valve ("Table 6a")

Table 6a Restrictor check valve

Coding	Description	Circuit symbol
Without coding	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)	

3 Parameters

General

Designation	Valve bank
Design	Segment construction
Model	Manifold mounting
Material	DIN 50979-Fe ZnNi 8 Steel; nitrided valve housing, functional inner parts hardened and ground
Attachment	See Chapter 4, "Dimensions"
Installation position	As desired
Ports	P = Hydraulic oil inlets (pump) or hydraulic oil lead-on T, R = Return lines A, B = Consumer ports M, MP = measurement fittings
Hydraulic fluid	Hydraulic fluid: equivalent to DIN 51524-1 part 1 to 3; ISO VG 10 to 68 as per DIN 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** 21/18/15...19/17/13
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!

© HAWE Hydraulik SE

Weight

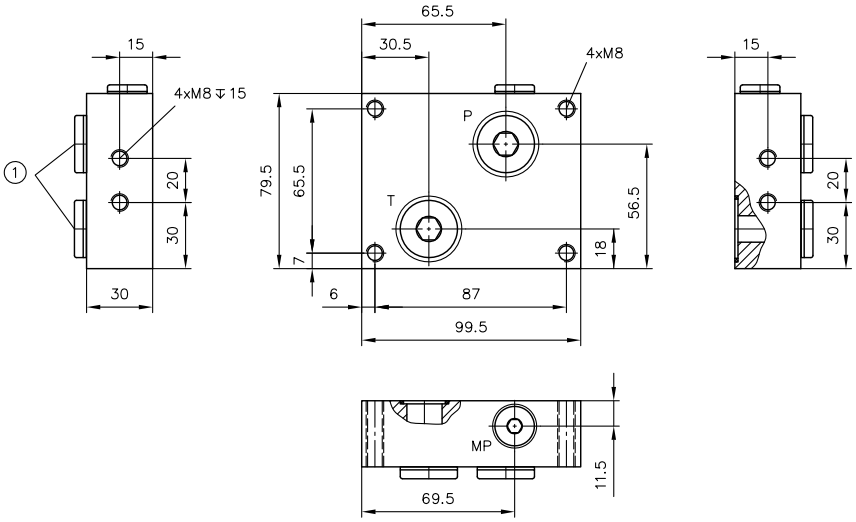
Connection block	**Coding**	
	E 33 L	= 1.6 kg
	E 33 L2	= 2.2 kg
	E 33 LX	= 1.6 kg
End plates	E 0 R	= 1.2 kg
	E 33 R	= 1.6 kg
	E 33 RA/...	= 2.6 kg
Sub-plates	22	= 2.7 kg
	22 S	= 2.7 kg
	222	= 2.6 kg
	32 /ADM 33 P	= 2.6 kg
Intermediate plates	ZPL 2/33/X	= 3.6 kg
	ZPL 2/33/S	= 3.6 kg
	ZPL 2/33/V	= 3.6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

4 Dimensions

All dimensions in mm, subject to change.

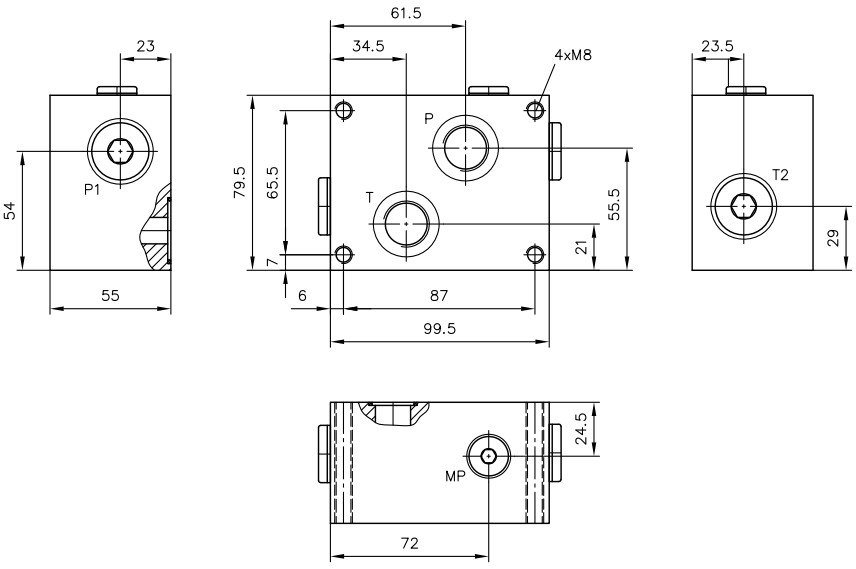
4.1 Connection block

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



1 Tapped plugs in type E 33 LX

Coding **E 33 L2**



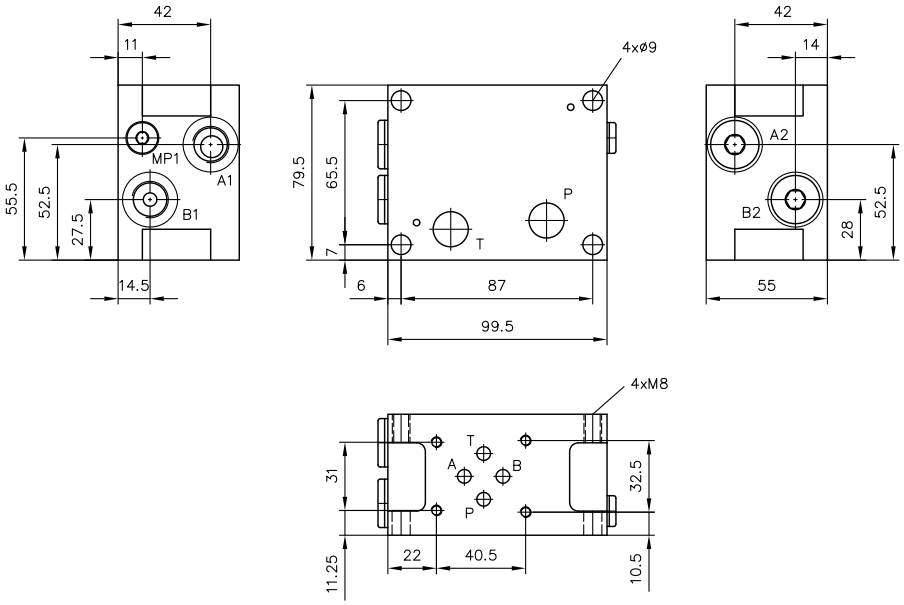
	Ports (ISO 228-1)
P, T, P1, T1	G 1/2
MP	G 1/4

 © HAWE Hydraulik SE

4.2 Valve sections

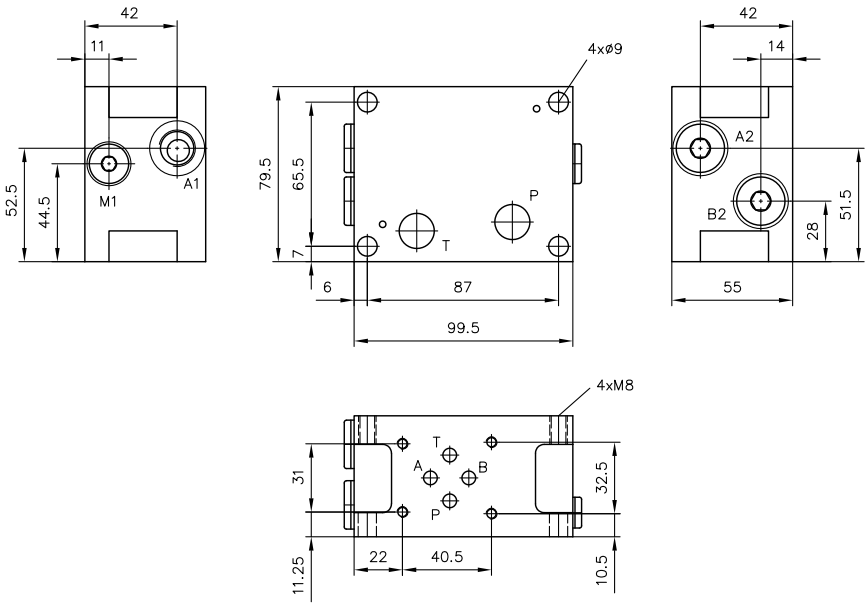
4.2.1 Sub-plates

Coding **22**



	Ports (ISO 228-1)
A1, A2 B1, B2	G 3/8
MP1	G 1/8

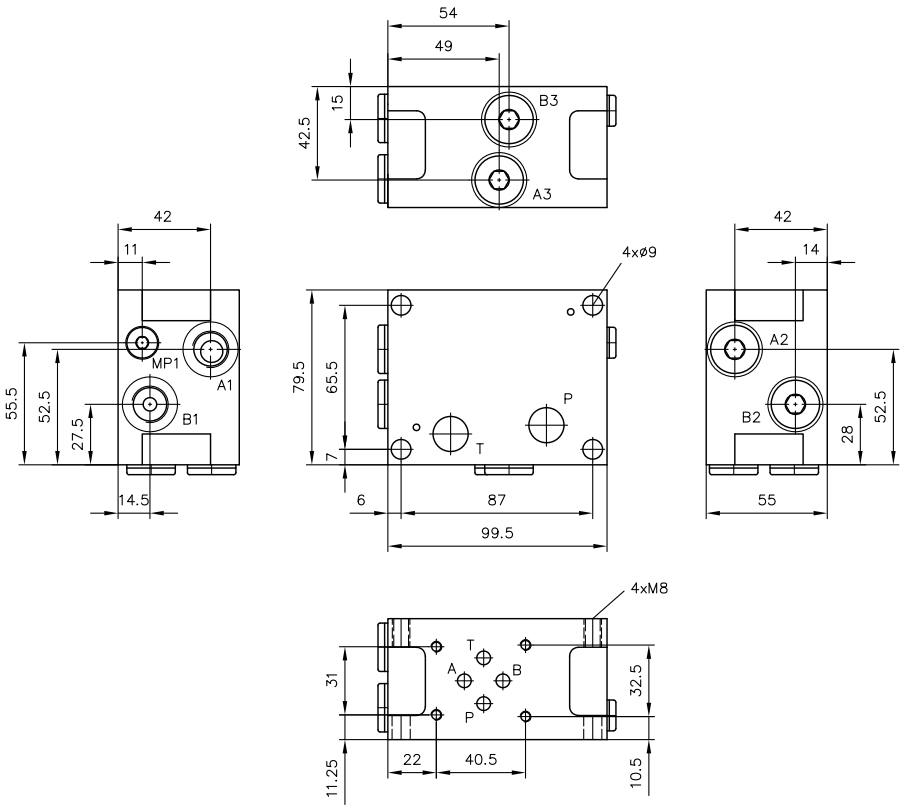
Coding **22 S**



	Ports (ISO 228-1)
A1, A2, B2	G 3/8
M1	G 1/4

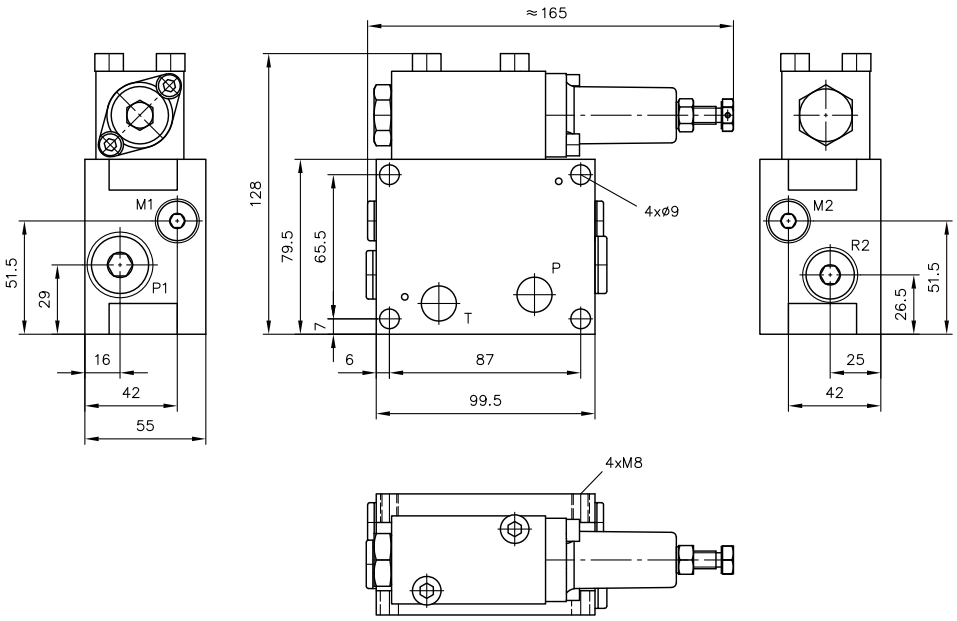
 © HAWE Hydraulik SE

Coding **222**



	Ports (ISO 228-1)
A1, A2, A3 B1, B2, B3	G 3/8
MP1	G 1/8

Coding **32 /ADM 33 P**

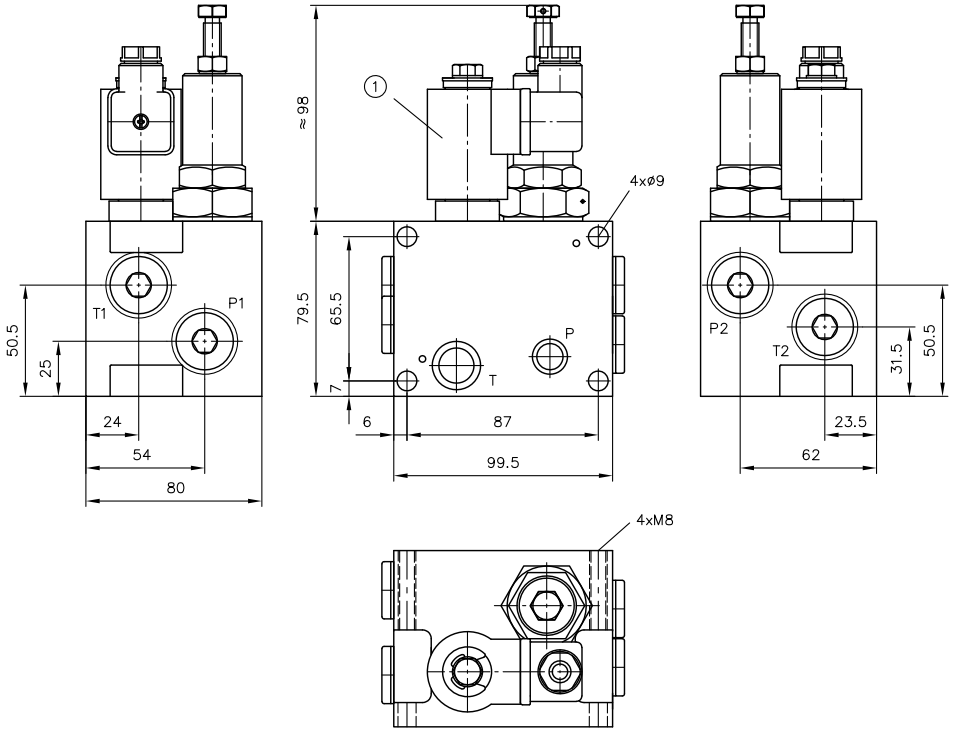


	Ports (ISO 228-1)
P1	G 1/2
R2	G 3/8
M1, M2	G 1/4

 © HAWE Hydraulik SE

4.2.2 Intermediate plates

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

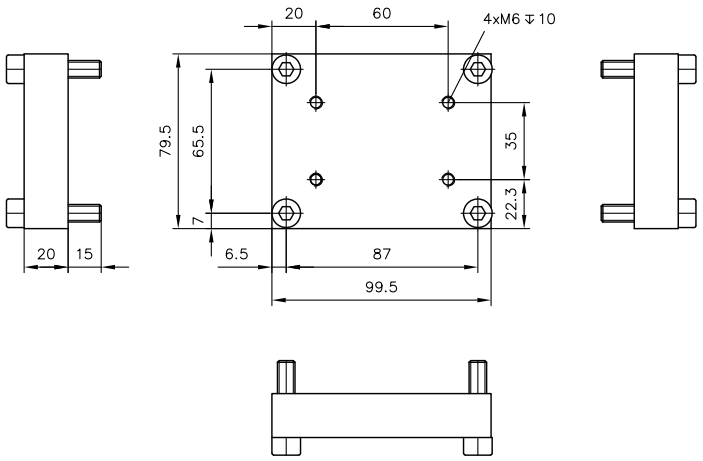


1 Idle circulation valve in type ZPL 2/33/S and ZPL 2/33/V

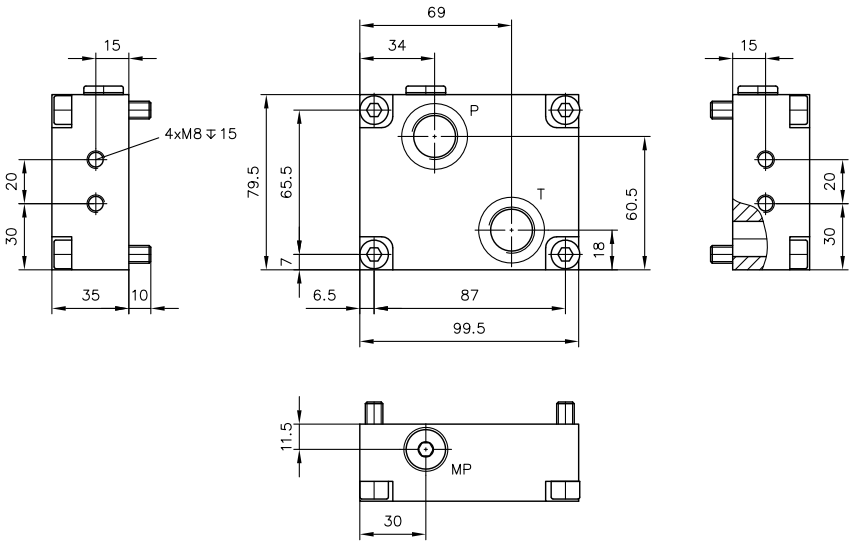
	Ports (ISO 228-1)
P1, P2 T1, T2	G 1/2

4.3 End plates

Coding **E 0 R**



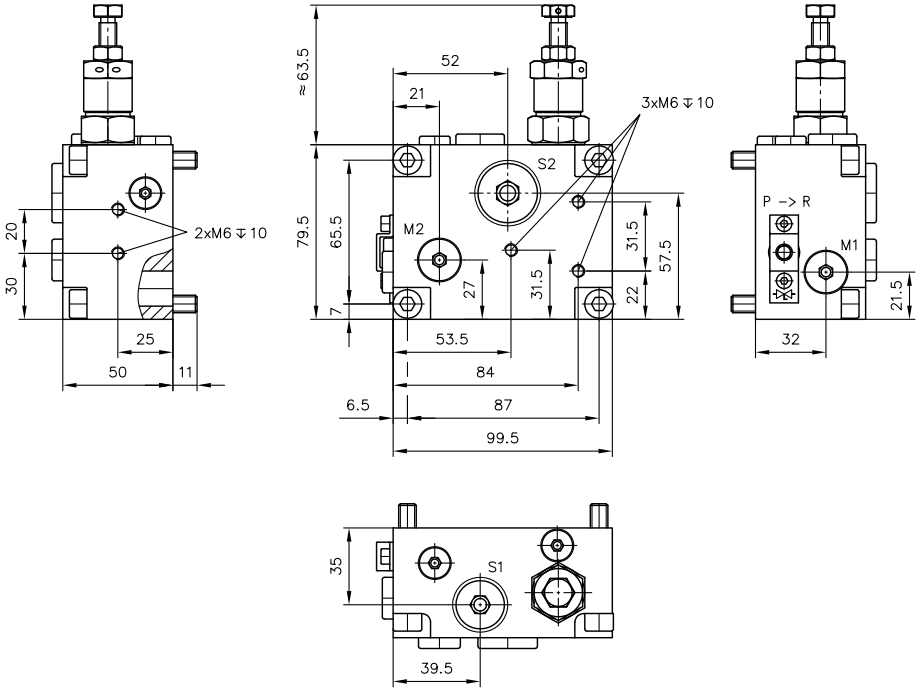
Coding **E 33 R**



	Ports (ISO 228-1)
P, T	G 1/2
MP	G 1/4

 © HAWE Hydraulik SE

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



	Port (ISO 228-1) (BSPP)
S1	G 3/8
S2	G 1/2
M1, M2	G 1/4

5 Assembly, operation and maintenance recommendations

5.1 Intended use

This valve is intended exclusively for use in hydraulic applications in 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.
- 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.
- All components must be suitable for the operating conditions in the event of application in an assembly.
- 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. Remove the product from operation and mark it accordingly.

✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

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

The product must be shut down correctly prior to disassembly.

⚠ **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.

 © HAWE Hydraulik SE

5.3 Operating instructions

Note product configuration and pressure / 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.

CAUTION

Risk of injury on overloading components due to incorrect pressure settings!
Risk of minor injury.

- Pay attention to the maximum operating pressure of the pump and the valves.
- Always monitor the pressure gauge when setting and changing the pressure.

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

New hydraulic fluid from the manufacturer does not necessarily have the required level of purity.
The hydraulic fluid must be filtered during filling.

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

Additionally applicable document: D 5488/1 Oil recommendations

5.4 Maintenance information

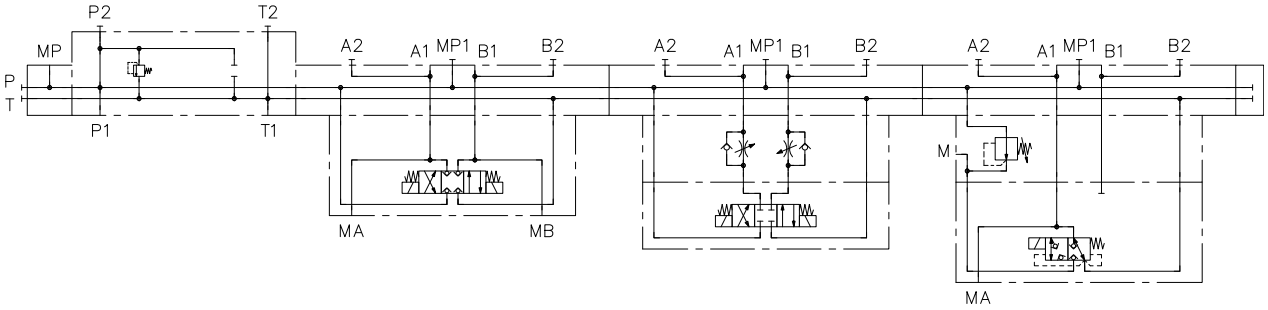
Conduct a visual inspection at regular intervals, but at least once per year, to check if the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

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 0945-00
Screw kit ISO 4762 A2-70	
M8x25	8750 0946-00
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

© HAWE Hydraulik SE

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

D 7788 BNG - 07-2021-1.1

HAWE Hydraulik SE
Einsteinring 17 | 85609 Aschheim/Munich | Postfach 11 55 | 85605 Aschheim | Germany
Tel +49 89 379100-1000 | Fax +49 89 379100-91000 | info@hawe.de | www.hawe.com