

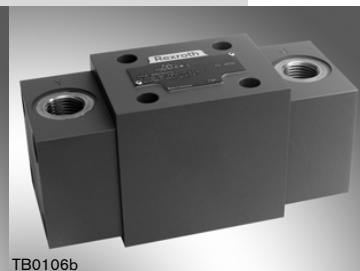
Directional control valves with mechanical, manual and hydraulic actuation

RE 22290-B/09.10
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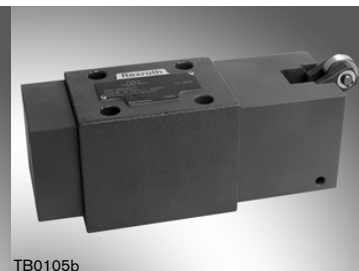
**Types WHD, WMM, WMR
(SO207)**



Type **4WMM**



Type **4WHD**



Type **4WMR**

Nominal size (NG) 10

Unit series 3X

Maximum operating pressure 315 bar

Operating Instructions

These Operating Instructions apply to directional control valves with mechanical, manual and hydraulic actuation for demanding requirements.

Short-term, once-only operation with

- temperatures up to 170 °C
- relative humidity up to 100 %
- external pressure up to 6.5 bar

DE Ihre Sprache? – Siehe Rückseite!
EN Your language? – See back page!

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1 Important basic information

1.1 Conventions

Cross-references are printed in *italics*.



This symbol indicates a threat of danger which will result directly in death or very serious injury if not avoided.



This symbol indicates a threat of danger which may result in death or very serious injury if not avoided.



This symbol indicates possible danger which may lead to minor or serious injury and/or to material damage.

IMPORTANT

This symbol indicates additional information.

2 Responsibilities

2.1 Liability, guarantee, warranty

Bosch Rexroth AG is not liable for damages that result from non-compliance with or disregard of this user's manual.

Unauthorised tampering with the valves shall render the warranty null and void.

Bosch Rexroth shall only be liable if the scope of delivery was shown to be defective. Bosch Rexroth shall not be liable if a deficiency occurs that involves parts having been replaced by the customer with equivalent but not identical parts as specified by the manufacturer.

Please refer to our general terms of supply or your contract for details of the guarantee and manufacturer's warranty.

2.2 Responsibilities of the operator/user

Mineral-oil-based pressure fluid is hazardous to water and flammable.

It may only be used if the relevant safety datasheet from the manufacturer is available and all the measures stipulated therein have been implemented.

If there is a risk of fluid leaking from the hydraulic product and contaminating water or the ground, the hydraulic product in question must be placed in a suitable collecting trough.

The operator is responsible for ensuring that

- the hydraulic product is used only in accordance with the proper use as defined in these Operating Instructions,
- the hydraulic product is used only in accordance with the technical data, ambient and operating conditions indicated in these Operating Instructions, and in particular that the stated limiting values are not exceeded.

If the hydraulic product is part of another product, e.g. a hydraulic system, then the person or organisation responsible for this other product (e.g. the designer/constructor of the system) shall ensure that the hydraulic product

- is used only in accordance with the proper use as defined in these Operating Instructions.
- is used only in such a manner that the technical data, ambient and operating conditions indicated in these Operating Instructions are complied with, and in particular that the limiting values are not exceeded in all probability and are in compliance with these Operating Instructions.

2.3 Copyright

This user's manual may only be reproduced – electronically or mechanically, in whole or in part - with the express written permission of Bosch Rexroth AG. It may likewise not be distributed, amended, transmitted, translated into another language or employed or copied for other purposes or by other parties without such consent.

3 Important basic safety instructions

3.1 Proper use

The hydraulic product has been conceived and designed for the transmission, open-loop or closed-loop control of energy and signals with the aid of the flow of oil.

However, only by carefully observing these Operating Instructions can accidents be prevented and problem-free operation of your Rexroth hydraulic product guaranteed.

Store the hydraulic product only in a dry, dust-free atmosphere that is free of corrosive agents and vapours, has a low moisture content and no large variations in temperature. We recommend the use of clean conservation oil for storage periods longer than six months.

IMPORTANT

The factory-applied corrosion protection is adequate for storage under the conditions given above provided that no condensation or leaked water can penetrate the hydraulic product.

The hydraulic product is only to be used with the pressure fluids given in these Operating Instructions. Information on using the hydraulic product with different pressure fluids is available on request.

Use the hydraulic product only if it is in perfect technical condition and only in accordance with the proper use as defined in these Operating Instructions. The connections, operating conditions and performance data defined in these Operating Instructions must not be changed.

IMPORTANT

If you wish to use the hydraulic product with connections, operating conditions and performance data other than those defined by Bosch Rexroth AG in these Operating Instructions then you should contact Bosch Rexroth AG in advance. The hydraulic product must not be used with connections, operating conditions and performance data other than those defined in these Operating Instructions without the written agreement of Bosch Rexroth AG. The hydraulic product must only be converted within the given scope.

During setting up or maintenance work, unless impractical, the safety devices fitted by Bosch Rexroth AG must be present, properly installed and in full working order. They must not be relocated, bypassed or rendered ineffective.

Rexroth hydraulic products must never be operated or maintained by persons under the influence of alcohol, drugs or other medication which affect one's ability to react.

4 Requirements for personnel, duty to take care

4.1 General requirements, qualifications

Persons under the age of 18 who are currently receiving instruction or training or are working under supervision may not work on Rexroth hydraulic products.

This does not apply to young persons of 16 or over if

- working on Rexroth hydraulic products is necessary in order for them to accomplish their training objective.
- their protection is guaranteed by the supervision of an experienced, competent person.
- they are allowed to use only tools, work implements and protective gear that preclude the risk of injury.

Specialist personnel are those who, using their specialist training, knowledge and experience as well as familiarity with the relevant conditions, can recognise possible dangers and undertake the necessary measures to eliminate possible accidents.

4.2 Requirements for maintenance personnel

Maintenance tasks can be necessary to maintain the functionality of the hydraulic product and include inspection, servicing and repair of hydraulic and electrical components.

The personnel carrying out these various tasks must have certain minimum qualifications. For inspections of the hydraulic components the personnel must fulfil the following requirements:

- They must be instructed about the tasks.
- Specialist knowledge of hydraulics is not required.

For maintenance of the hydraulic components, the personnel must fulfil the following requirements:

- They have been instructed in the relevant activity.
- Specialist knowledge of hydraulics is required to carry out servicing work.

For maintenance of the hydraulic components the personnel must fulfil the following requirements:

- The personnel must be hydraulics experts instructed in the tasks as defined above.
- The personnel must be familiar with the function of the hydraulic system as a whole, from subsystems to their interaction with the function of the machine as a whole.
- The personnel must be able to read hydraulic circuit diagrams, interpret individual functions from their symbols and understand function diagrams.
- The personnel must possess knowledge of the function and construction of hydraulic elements.

For work on the electrics the following applies:

All work on electrical equipment may only be carried out by an authorised, qualified electrician, or by instructed persons under the guidance and supervision of an authorised qualified electrician, in accordance with the rules applicable to electro-technical products.

4.3 Disposal

Empty hydraulic products and dispose of them as scrap metal.

Collect residual pressure fluid and dispose of it in accordance with the instructions given in the safety datasheet of the pressure fluid.

4.4 Special ancillary dangers and protective measures



Danger zone	Ancillary danger	Protective measure(s), safety instructions
Connections and pressure lines (pipes and conduits)	Risk of injury or loss of life from sprayed pressure fluid under high pressure during maintenance work.	Depressurise the hydraulic system before starting maintenance work. Relieve any accumulators of pressure. Rectify leaks immediately.
	Risk of injury or loss of life from sprayed pressure fluid under high pressure in case of a pressure increase caused by a rise in temperature.	When operating the valve at a temperature above the maximum permissible temperature for continuous operation, the pressure of the pressure fluid enclosed in the pipes and in the valve may rise to impermissible high values due to heat expansion. Dimension the pipes such that they withstand the expected pressure under these conditions. If necessary, make sure that the pressure fluid volume can drain off to the tank without pressure.
Surfaces of components and pressure lines	Risk of burning due to high surface temperatures	Allow hydraulic parts to cool before commencing maintenance work. Wear protective clothing.
Electrical components	Electric shock	Work on electrical components only in the non-powered state. Switch electrical connections off before assembly and disassembly work starts. All tasks that require product components to be dismantled must be performed only within the given scope.
	Failure caused by excessive moisture entry following cleaning with a high-pressure cleaner	Shield the hydraulic product from the direct effect of high-pressure water jets.

Handling pressure fluid without protection is hazardous to health.

Please observe the manufacturer's safety instructions and the relevant safety datasheets for the pressure fluid that you are using.



Danger zone	Ancillary danger	Protective measure(s), safety instructions
Connections and pressure lines (pipes and conduits)	Water or ground pollution due to leakage	Rectify leaks immediately.

IMPORTANT

Also see 2.2 Responsibilities of the operator/user.

5 Supplementary basic safety advice

5.1 Advice on valve use

Note the following advice during the planning and design stages:



Be aware of possible pressure intensification if the valve is connected to the chamber on the piston rod side of a differential cylinder. If the outflow of the hydraulic medium from this chamber is obstructed, then the pressure on the cylinder can result in a pressure intensification, which may damage the cylinder chamber, feed line and valve.

Make sure that there is adequate physical protection in the event of the use of high-pressure water jets during cleaning.

To prevent soiling of the valve and terminals of an actuator, the valve must be installed in a low-dust environment.

IMPORTANT

Pressure peaks in the common return line from more than one valve can cause unintentional piston movements and undesirable switching processes. This applies in particular if the valve used has a detent. It is recommended that separate return lines are used.

The valve is suitable for continuous operation

- at temperatures up to 80 °C
- in a dry atmosphere
- with an external pressure of max. 6.5 bar
- with an operating pressure of maximum 315 bar.

The valve can be functionally operated for a short time and once only i.e. for one hour at the most,

- at temperatures up to 170 °C
- in 100% relative humidity
- with an external pressure of max. 6.5 bar
- with an operating pressure of maximum 100 bar

– with the exception of a possibly existing limit switch.

After such use the valve must be replaced with a new one!

Conditions of use beyond these are not permissible.

5.2 Use of valves with electrical position monitor

If the maximum operating temperature of 80 °C is exceeded, the limit switch is permanently damaged and no usable signal is available. The valve itself is damaged after such use and must be replaced with a new one or it must be returned to Bosch-Rexroth for repair, see *18.3 Contacts for repair and replacement parts*.

To prevent overloading of the voltage supply connected to the limit switch, either the voltage supply of the position monitor must be deactivated or a short-circuit-proof voltage supply must be applied for temperatures above 80 °C.

6 Ordering details

	10	3X/ / / V	SO207	
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<p>3 main connections = 3</p> <p>4 main connections = 4</p> <p>mechanical actuation roller plunger = WMR</p> <p>mechanical actuation hand lever = WMM</p> <p>hydraulic actuation = WHD</p> <p>Nominal size = 10</p> <p>Piston symbols, e. g. C, E, EA, EB etc.</p> <p>Series 30 to 39 = 3X (30 to 39; dimensions for installation and connection unchanged)</p>	<p>SO207 = Special model ¹⁾</p> <p style="text-align: right;">For details see 11 Unit dimensions</p> <p>V = FKM seals (other seals on request)</p> <p>IMPORTANT Observe the seal suitability for the hydraulic fluid used!</p> <p>no description = without mechanical limit switch</p> <p>YAW = Mechanical limit switch for the monitoring of switch position A</p> <p>YBW = Mechanical limit switch for the monitoring of switch position B</p> <p>no description = with spring return</p> <p>O = without spring return</p> <p>F = with detent</p> <p>OF = without spring return, with detent</p>
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¹⁾ SO207 = Directional control valve with seal against an external pressure of 6.5 bar, max. operating pressure 100 bar Use at up to 170 °C for 1 hour.

7 Piston symbols

	= A		= B	
	= C		= D	
	= E ¹⁾		= F	<p>¹⁾ Example:</p> <ul style="list-style-type: none"> • Piston E with switching position "a" → Ordering details ..EA.. • Piston E with switching position "b" → Ordering details ..EB..
	= G		= H	
	= I		= J	
	= K		= L	
	= M		= N	
	= O		= P	
	= Q		= R	
	= S		= T	
	= U		= V	
	= W		= X	

7.1 Piston symbols for hydraulically actuated valves

Ordering details		Valve types
Piston symbols	Detent	WHD
A, C, D		
	.. / O ..	
	.. / OF ..	
B, Y		
E, F, G, H, J, L, M, P, Q, R, T, U, V, W	Switch position "a" ¹⁾ = .A	
	Switch position "b" ¹⁾ = .B	

¹⁾ See 7 Piston symbols

7.2 Piston symbols for mechanically/manually actuated valves

Ordering details		Valve types		
Piston symbols	Detent	WMR (Roller plunger)	WMM (Hand lever)	
A, C, D	../F..			
B, Y	../F..			
E, F, G, H, J, L, M, P, Q, R, T, U, V, W	Switch position "a" ¹⁾ = .A			
	Switch position "b" ¹⁾	../F..		
		../F..		

¹⁾ See 7 Piston symbols

8 Functional description

8.1 Directional control valves, type WMM

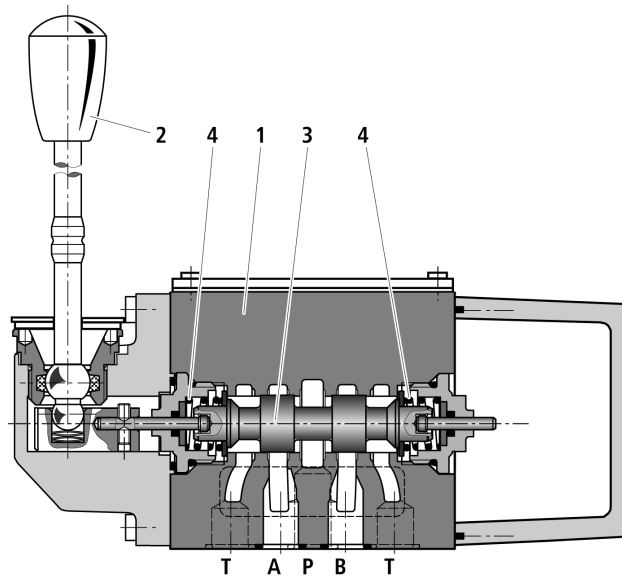
Directional control valves type **WMM** control start, stop and direction of a flow.

They mainly consist of the housing (1), the hand lever (2), the control piston (3) and two reset springs (4).

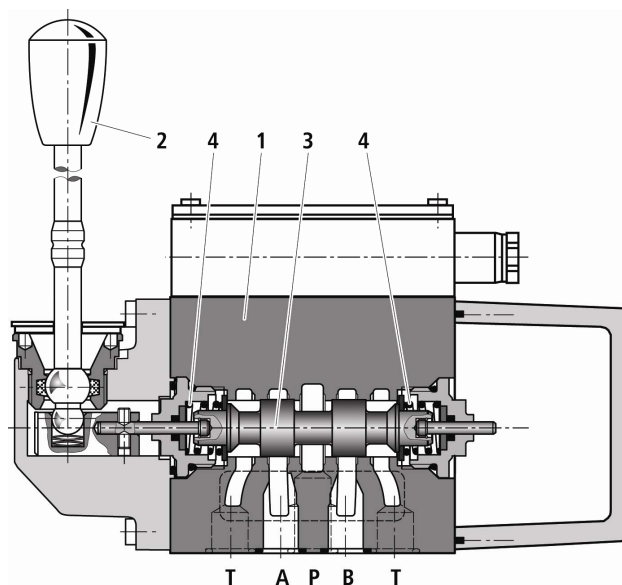
When not actuated, the control piston (3) is held in centre position or initial position by means of the reset springs (4).

The control piston (3) is moved to the desired switch position by means of the hand lever (2).

Type 4WMM10.3X/...



Type 4WMM10.3X/...Y.W...



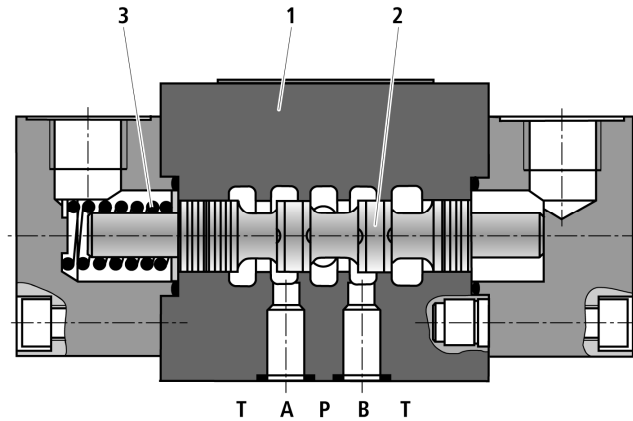
8.2 Directional control valves, type WHD

Directional control valves type **WHD** control start, stop and direction of a flow.

They mainly consist of the housing (1), the control piston (2), and the reset spring (3).

When not actuated, the control piston (2) is held in centre position or initial position by means of the reset spring (3).

Typ 4WHD 10 .3X/...



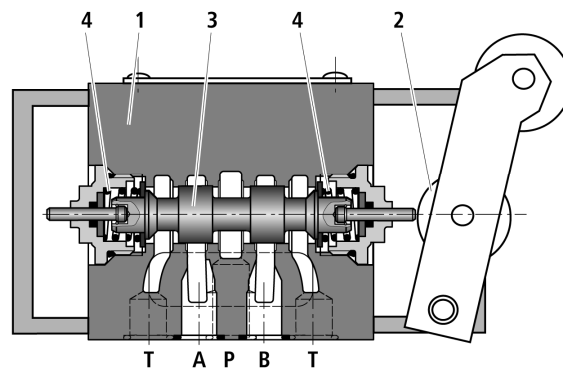
8.3 Directional control valves, type WMR

Directional control valves type **WMR** control start, stop and direction of a flow.

They mainly consist of the housing (1), the roller plunger (2), the control piston (3) and two reset springs (4).

When not actuated, the control piston (3) is held in centre position or initial position by means of the reset springs (4).

Typ 4WMR 10 .3X/...



9 Technical data

General

Valve type		WHD	WMM	WMR
Installed position		any		
Control pressure	bar	10 ... 100	–	–
Control volumes	cm ³	3.83	–	–
Actuating force	- with detent	N	–	16 ... 23
	- with spring return	N	–	20 ... 27
	- 2 switching positions	N	–	–
	- 3 switching positions	N	–	–
Mass, valve with	- mechanical, manual actuation	kg	–	3.8
	- 1 actuation cylinder	kg	3.0	–
	- 2 actuation cylinders	kg	3.3	–
Ambient temperature range		°C	– 20 ... +80	

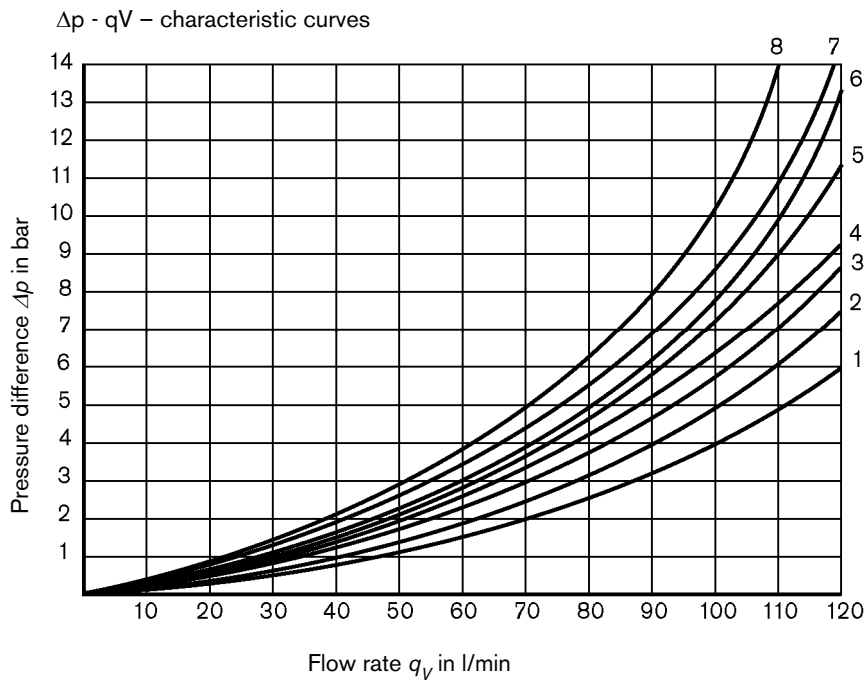
Hydraulic

Operating pressure, max.	up to 80 °C Connection P, A, B	bar	315
	up to 80 °C Connection T	bar	160
	above 80 °C up to max. 170 °C Connection P, A, B, T	bar	100
Flow rate, max.		l/min	up to 120
Cross section for flow (switching position 0)	with symbol V	mm ²	11 (A/B → T); 10.3 (P → A/B)
	with symbol W	mm ²	2.5 (A/B → T)
	with symbol Q	mm ²	5.5 (A/B → T)
Hydraulic fluid ¹⁾	Mineral oil (HL, HLP) to DIN 51524 Biologically fast degradable pressure fluids to VDMA 24568 (see also RE 90221); HETG (rape seed based oil); HEPG (polyglycols); HEES (synthetic esters); other pressure fluids on request		
Temperature range of pressure fluid		°C	– 20 ... +80
Viscosity range		mm ² /s	2.8 ... 500
Maximum permitted contamination level of hydraulic fluid Purity class to ISO 4406 (c)	Class 20/18/15		

¹⁾ The purity classes stated for the components must be adhered to in hydraulic systems.
Effective filtration prevents malfunctions and increases at the same time the service life of the components.
For filter selection see www.boschrexroth.com/filter.

10 Characteristic curves

The characteristic curves were determined with test oil HLP46 at an oil temperature of $40 \pm 5^\circ\text{C}$.



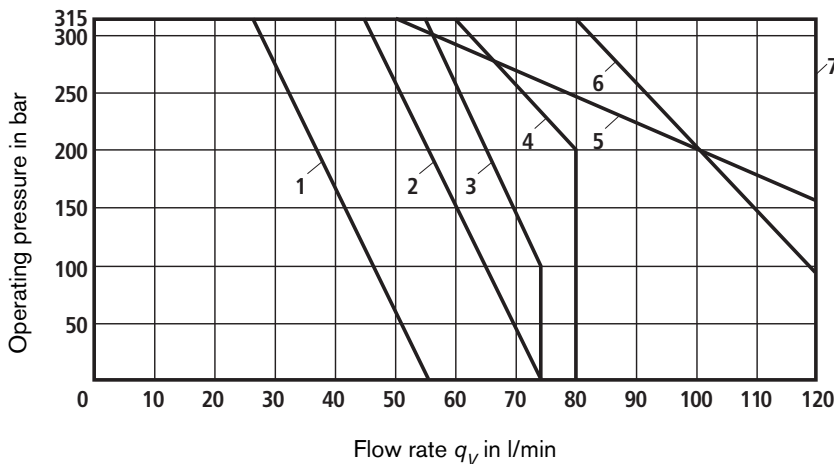
Piston symbols	Flow direction			
	P-A	P-B	A-T	B-T
A	4	3	–	–
B	3	4	–	–
C	3	3	4	4
D	3	3	5	5
Y	4	4	6	6
E	2	2	4	4
F	1	2	3	4
G,T	4	4	7	7
H	1	1	5	5
J	2	2	3	3
L	3	3	2	4
M	1	1	4	4
P	3	1	5	5
Q	2	2	2	2
R	3	4	3	–
U	3	3	5	2
V	2	2	3	3
W	3	3	3	3

8 Symbol "R" in switching position b (B→A)
 8 Symbols "G" and "T" in centre position (P→T)

The stated switching capacity limits apply to use with two flow directions (e.g. flow from P to A and concurrent return flow from B to T). Due to the forces acting inside the valve arising from the flows, the permissible switching capacity limits in

systems with only one flow and in only one flow direction (e.g. from port P to A and blocked port B) can be considerably reduced. Please contact us before such use.

Switching capacity limits

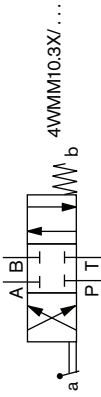


Characteristic curve	Piston symbols
1	A, B
2	A/O
3	H
4	F, G, P, R, T
5	J, L, Q, U, W
6	C, D, E, M, V, Y
7	C/O, C/OF, D/O, D/OF

11 Unit dimensions

Unit dimensions type 4WMM10.3X/... (nominal sizes in mm)

S0207 = manually actuated directional control valve with seal against an external pressure of 6.5 bar max. operating pressure 100 bar use at up to 170 °C for 1h



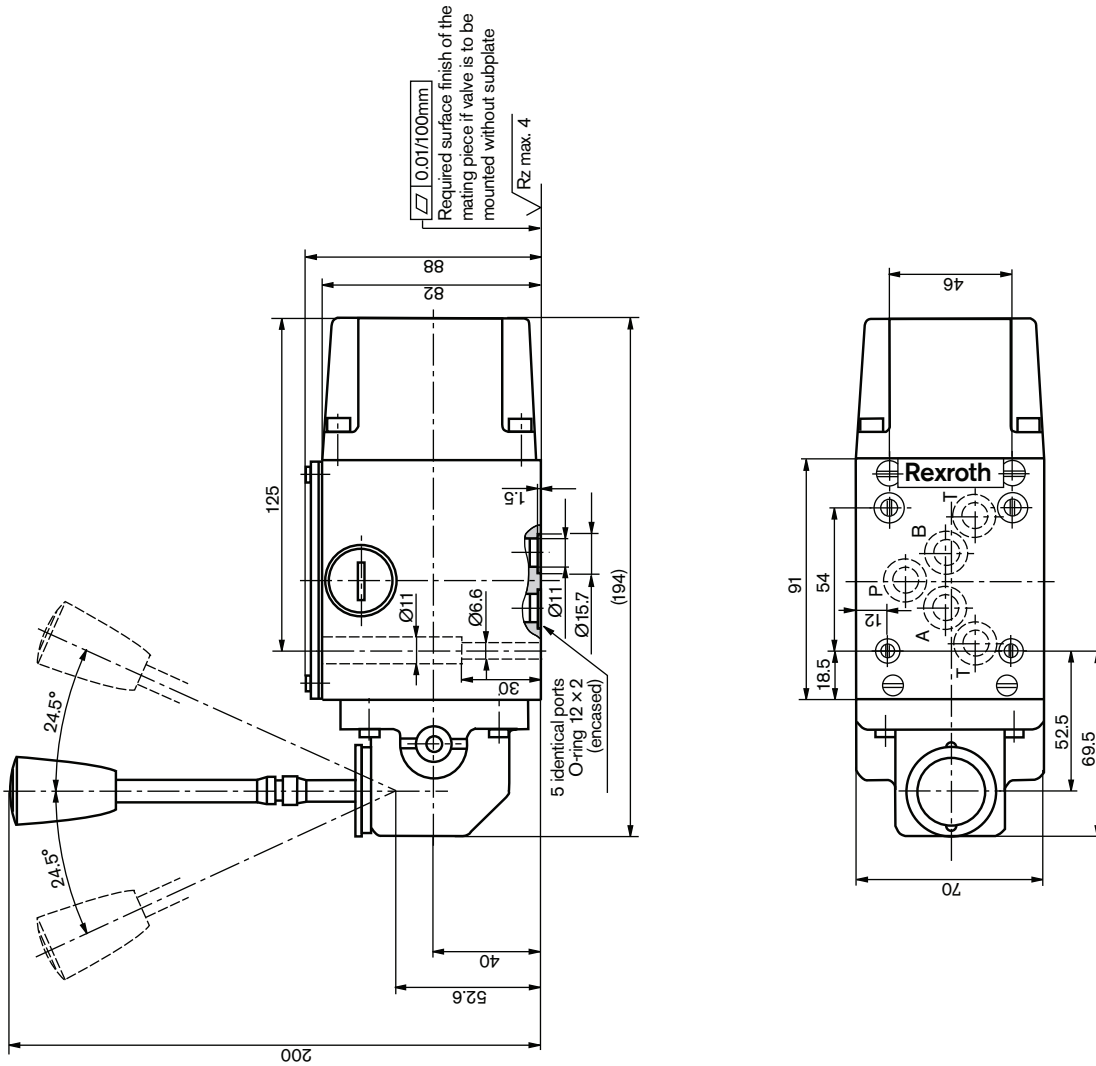
Hydraulic characteristics:
permissible operating pressure, see page 14

Port designations
P = pump
T = tank
A, B = consumers
L = leakage oil drain

Mounting hole configuration to ISO 4401-05-04-05, DIN 24340-A10

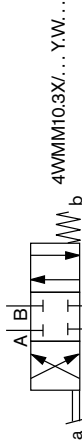
Valve fastening bolts
M6 x 40 ISO 4762-10.9-f1 Zn-240h-L
tightening torque $M_a = 9 \text{ Nm}$

Subplates:
G66/01 (G3/8)
G67/01 (G1/2)
G634/01 (G3/4)
to Technical Datasheet RE 45054

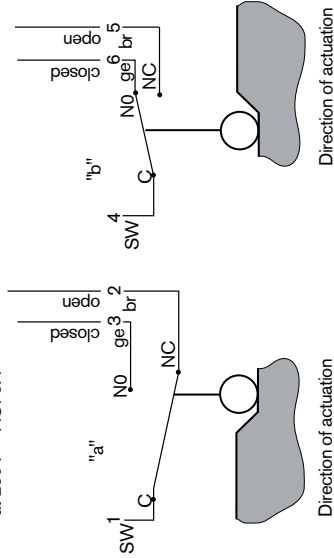


Unit dimensions type 4WMM10.3X/...Y.W... (nominal sizes in mm)

S0207 = manually actuated directional control valve with mechanical limit switch, with seal against an external pressure of 6.5 bar max. operating pressure 100 bar use at up to 170 °C for 1h



Electrical specification for limit switches "a" and "b" permissible current loads:
at 30 V DC: 2A
at 250V ~ AC: 5A



Limit switches for valve position monitoring "a" and "b" with toggle switch

Terminals: 1-2 and 4-5 normally open
1-3 and 4-6 normally closed

remove type plate before connecting limit switches

Hydraulic characteristics:
permissible operating pressure, see page 14

Port designations

- P = pump
- T = tank
- A, B = consumers
- L = Leakage oil drain

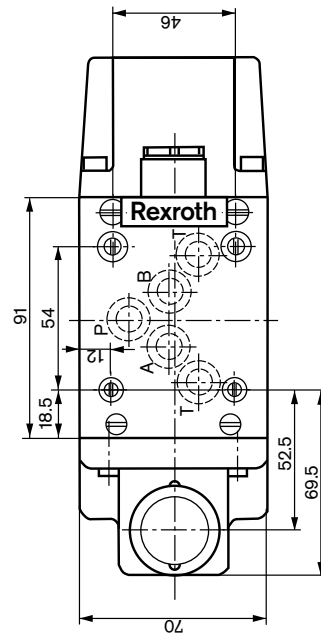
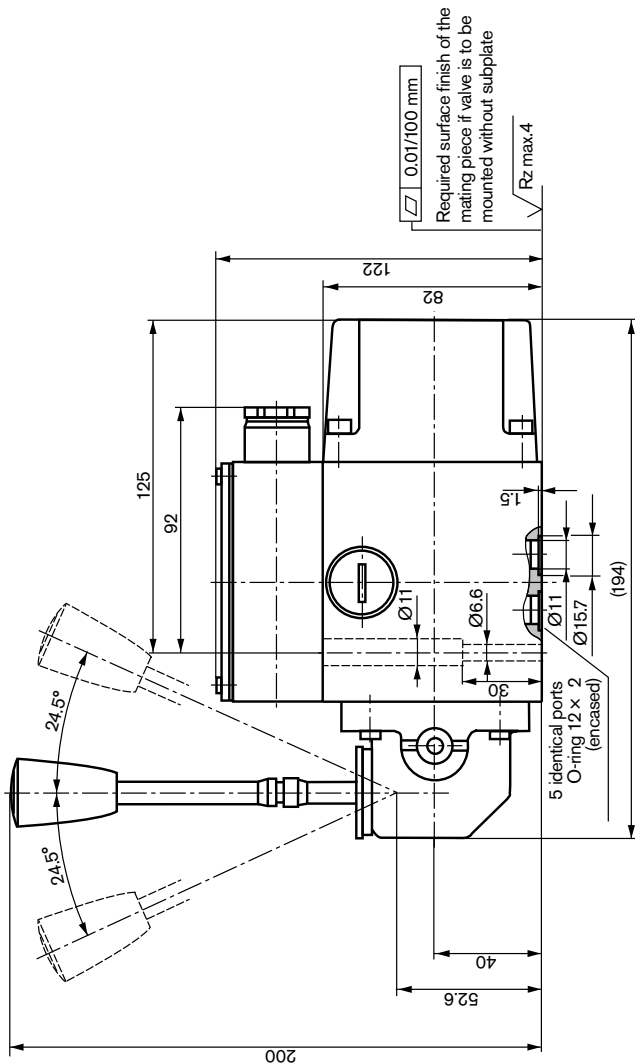
Mounting hole configuration to ISO 4401-05-04-05, DIN 24340-A10

Valve fastening bolts
M6 x 40 ISO 4762-10.9f1 Zn-240h-L
tightening torque $M_a = 9\text{Nm}$

Subplates:

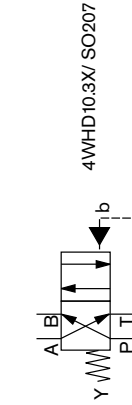
- G66/01 (G3/8)
- G67/01 (G1/2)
- G634/01 (G3/4)

to Technical Datasheet RE 45054



Unit dimensions type 4WHD10.3X/... (nominal sizes in mm)

SO207 = directional control valve, hydraulic actuation with seal against external pressure of 6.5 bar max. operating pressure of 100 bar use at up to 170 °C for 1h



Hydraulic characteristics:
 permissible operating pressure, see page 14
 max. pressure of pilot oil 100 bar
 min. pressure of pilot oil 10 bar

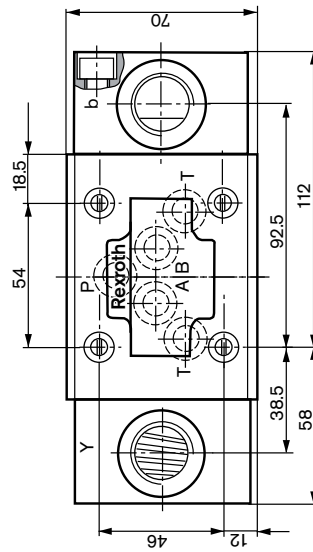
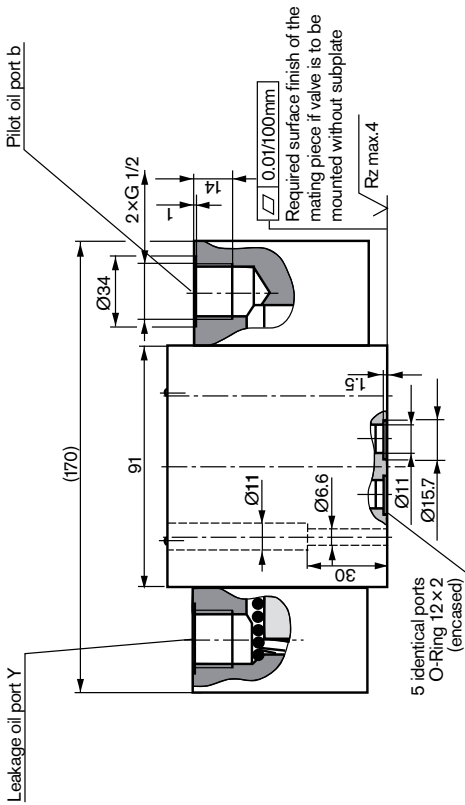
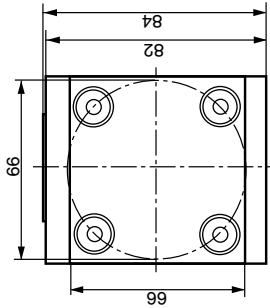
Port designations
 P = pump
 T = tank
 A, B = consumers
 Y = pilot oil drain (leakage oil)

Mounting hole configuration
 ISO 4401-05-04-0-05, DIN 24340- A10

Valve fastening bolts
 M6 x 40 ISO4762-10.9-f1 Zn-240h-L
 tightening torque $M_t = 9 \text{ Nm}$
 spool stroke = 5.5 mm

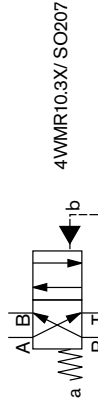
Subplates:
 G66/01 (G3/8)
 G67/01 (G1/2)
 G634/01 (G3/4)

to *Technical Datasheet RE 45054*



Unit dimensions type **4WMM10.3X/...** (nominal sizes in mm)

S0207 = directional control valve, roller plunger actuation
 with seal against external pressure of up to 6.5 bar
 max. operating pressure 100 bar
 use at up to 170 °C for 1h



Hydraulic characteristics:
 permissible pressure, see page 14

Port designations
 P = pump
 T = tank
 A, B = consumers

Mounting hole configuration to
 ISO 4401-05-04-05, DIN 24340-A10

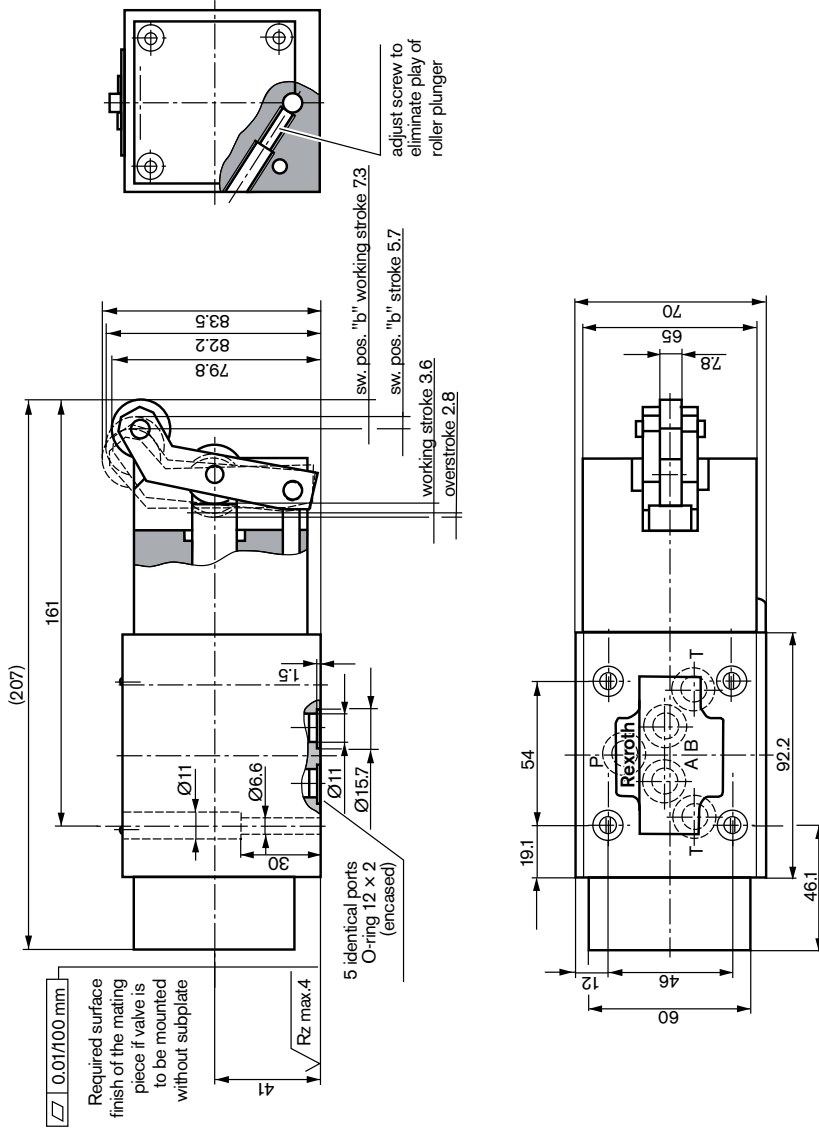
Valve fastening bolts
 M6 x 40 ISO4762-10.9-f1 Zn-240h-L
 tightening torque $M_a = 9 \text{ Nm}$

Ratio of spool stroke to roller plunger = 1:2.04
 spool stroke = 3.6 mm

Subplates:

- G66/01 (G3/8)
- G67/01 (G1/2)
- G634/01 (G3/4)

to *Technical Datasheet RE 45054*



12 Assembly and (initial) start-up

12.1 Safety advice for assembly and (initial) start-up



Before any work such as assembly or disassembly is carried out on the valve, the hydraulic system must be depressurised and the electrical control system de-energised.

Check that the Operating Instructions for the valve are present and complete. Contact us if the Operating Instructions are incomplete.

The delivery is also to be checked for completeness and any transport damage.

Before any assembly and disassembly work starts, the surroundings must be cleaned so that no dirt can get into the oil circulation system. Only fibre-free cloth or special paper is to be used for cleaning.

12.2 Assembly

1. Check the connection surface for the required surface quality (see installation drawing). Remove the guard plate from the valve and keep it safe in case any repairs are necessary later.
2. Check the seals and bushings for the metal support of the seals on the valve connection surface for completeness. The use of other seal types is not permitted.
3. Mount the valve on to the connection surface.



In order to achieve the proper strengths of connection, only the valve fastening bolts indicated in 19.1 Available accessories are to be used!

4. If subplates are used or if takes place on to similar cast iron mounting surfaces, all fastening bolts are to be tightened with a torque wrench (tolerance $\leq 15\%$) to a tightening torque of 9 Nm.
This tightening torque is related to the maximum permissible operating pressure.
If the valve is used at a reduced maximum pressure and mounted on to a mounting surface made from a different material, then, if necessary to avoid causing damage, a lower tightening torque may be applied.



Always attach the valve with all 4 fastening bolts in order to create a proper seal.



Check the construction of the hydraulic product against the circuit diagrams, lists of equipment and assembly drawings. If there are any differences, draw this to the attention of the people responsible.

5. Make sure that pipes and hoses are connected at all ports or that the ports are sealed with screw plugs.
6. Carry out a special check to make sure that the union nuts and flanges are correctly tightened at the pipe connections and flanges.

IMPORTANT

Mark all the checked connections, e.g. with a permanent marker.

7. Make sure that all pipes and hoses and every combination of connection pieces, couplings or connection points with hoses or pipes are checked for their operational safety by someone who has the appropriate knowledge and experience.

13 Making the electrical connection

Valve types WMM are optionally available with a limit switch for electrical position monitoring. Access to the terminal box and to the connections of the limit switch is only possible after removal of the nameplate. For the pin assignment of the valve see *11 Unit dimensions*. The pin assignment can be read on the sign applied to the valve underneath the terminal box. After connecting the wire, re-attach the nameplate.

CAUTION

De-energise the connection leads before assembly.

Use fine-strand wires only if they have pressed-on wire end ferrules.

Only use wires that satisfy the requirements relating to the terminal width of the connection terminals.

Avoid sharp bends in the connection leads and litz wires to prevent short-circuits and breaks.

Install cable and wire entries only in accordance with the installation instructions. Before installation, check that the individual parts of the cable and wire entries are all present and that the sealing elements are free of damage.

During installation, pay attention to the proper seal between cable, cable and wire entries and terminal box.

Arrange the connection leads so that they are slack. The first fixing point must be within 15 cm of the cable bushing.

Characteristics of the connection terminals and fastenings

Position	Function	Connectable wire cross sections	Tightening torque
1	Operating voltage connection	single-strand 0.75 ... 2.5 mm ² fine-strand 0.75 ... 1.5 mm ²	0.4 ... 0.5 Nm
2	Protective ground connection	single-strand max. 2.5 mm ² fine-strand max. 1.5 mm ²	1.2 ... 2.4 Nm
3	Equipotential bonding conductor terminal	single-strand 0.75 ... 2.5 mm ² fine-strand 0.75 ... 1.5 mm ²	2.0 ... 4.0 Nm
4	Screws for cover	–	1.0 ... 1.1 Nm

14 Bringing into first use, subsequent bringing into use

14.1 Venting the hydraulic system

IMPORTANT

Observe the Operating Instructions for the equipment or machinery in which the valve is installed.

1. Subject the valve to pressure several times before it is placed into full operation. This will expel any remaining air from the valve. This measure will prevent any mechanical damage being caused from high acceleration movements of the fluid or the valve piston, and will extend the service life of the valve.

14.2 Checking for leakage

Check that no hydraulic medium emerges from the valve or the connections when the valve is operated.

15 Disassembly



Before starting disassembly work, check that the hydraulic system is depressurised and the electrics are de-energised.

1. If an electrical position monitor is present, remove the nameplate, properly disconnect the electrical connections of the position monitor and re-attach the nameplate.
2. Have a container ready to collect the escaping hydraulic medium.
3. Unscrew the valve fastening bolts using a suitable tool only.
4. Remove the fastening bolts and detach the valve from the flange surface.
5. Collect the escaping hydraulic medium in the container and dispose of it properly.
6. If the valve is returned to the manufacturer for maintenance, close the valve connection surface using the supplied guard plate or protect it with equivalent packing in order to prevent damage and contamination by dirt.

16 Trouble-shooting

The valve is not susceptible to faults as long as the specified conditions of use are complied with, in particular the quality of the oil.

Fault	Possible cause(s)	Remedy
Valve does not switch	No pressure at P	Check or reapply pressure at P port
	Valve piston sticks due to dirt	Remove valve and replace it with a new one
	Limit switch jamming	Remove the valve and replace it with a new one or send it to Bosch-Rexroth for repair, see 18.3
No signal from limit switch	Limit switch jamming	Remove the valve and replace it with a new one or send it to Bosch-Rexroth for repair, see 18.3
	Limit switch damaged after valve was heated above 80 °C	Remove the valve and replace it with a new one or send it to Bosch-Rexroth for repair, see 18.3
	Electrical fault in limit switch	Remove the valve and replace it with a new one or send it to Bosch-Rexroth for repair, see 18.3
	Break in cable	Replace connection cable
External leaks	Defective seal	
	• Defective seal on connection surface	Remove valve and replace seals
	• Other leaks	Remove valve and replace it with a new one

Following a breakdown due to contamination, it is essential to check the oil quality and if necessary to improve it by suitable means, such as flushing or the additional building in of filters.

17 Inspection and servicing

The following inspection, testing and maintenance tasks are to be carried out regularly. The respective intervals are to be chosen (also taking into account the operating conditions) such that defects that can reasonably be expected are dealt with in good time. Nevertheless, the check is to be carried out at least once every three years from the date of manufacture of the valve. The date of manufacture (year and week) can be obtained from the valve nameplate.

17.1 Inspection and maintenance work on the installed valve

You can find information for ordering seal sets in *18.2 Available replacement parts*.

1. De-energise the connection lead of the limit switch, if present.
2. Remove heavy dirt deposits from the exterior.
3. Check the valve for external leaks, if necessary replace seals, see *18.1 Rectifying external leaks*.
4. Check all external threaded connections and fastenings for completeness.
5. Check the connection lead of the limit switch for damage, if present. Replace the connection lead if there is any visible damage.

18 Repairs and replacement parts

18.1 Rectifying external leaks

External leaks at the valve contact surface can be rectified on site.

Other types of leak have to be rectified by the manufacturer's specialist personnel.

18.1.1 Rectifying leaks at the valve connection surface

1. Remove the valve, see *15 Disassembly*.
2. Check the seal recesses on the valve connection surfaces for cleanliness and damage.
3. Fit new seals, see *12 Assembly and (initial) start-up*.
4. Re-install bushings for the metal support of the seals.

18.2 Available replacement parts

- Seal sets, on request

IMPORTANT

Make sure the seal materials are suitable for the hydraulic medium being used.

18.3 Contacts for repair and replacement parts

Bosch Rexroth AG
Service Industriehydraulik
Bürgermeister-Dr. Nebel-Str. 8
97816 Lohr am Main
Germany

Telephone +49 (93 52) 18-11 64
Telefax +49 (93 52) 18-33 63

www.boschrexroth.com/service

19 Accessories

19.1 Available accessories

- Valve fastening bolts:
In order to achieve the proper strengths of connection, only the following valve fastening bolts are to be used.

4 cheese-head screws
ISO 4762 – M6 × 40 - 10.9 - flZn - 240h - L
(coefficient of friction 0.09...0.14 in accordance with VDA 235-101), Mat. No. R913000058

19.2 Address for ordering accessories and valves

Headquarters:
Bosch Rexroth AG
Hydraulics
Zum Eisengiesser 1
97816 Lohr am Main
Germany

Telephone +49 (93 52) 18-0
Telefax +49 (93 52) 18-40

or the relevant sales organisation. You can find the addresses on the Internet at:

www.boschrexroth.com

DE Bestellinformationen für deutsche Betriebsanleitung
EN Ordering Information for Operating Instructions in English

Materialnummer R901134640
Material Number R901134641

Bosch Rexroth AG
Hydraulics
Zum Eisengiesser 1
97816 Lohr am Main, Germany
Telephone +49 (0) 93 52 / 18-0
Telefax +49 (0) 93 52 / 18-23 58
documentation@boschrexroth.de
www.boschrexroth.de

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