FLUID POWER SOCIETY
NEW SOUTH WALES

July 2025

Event Night

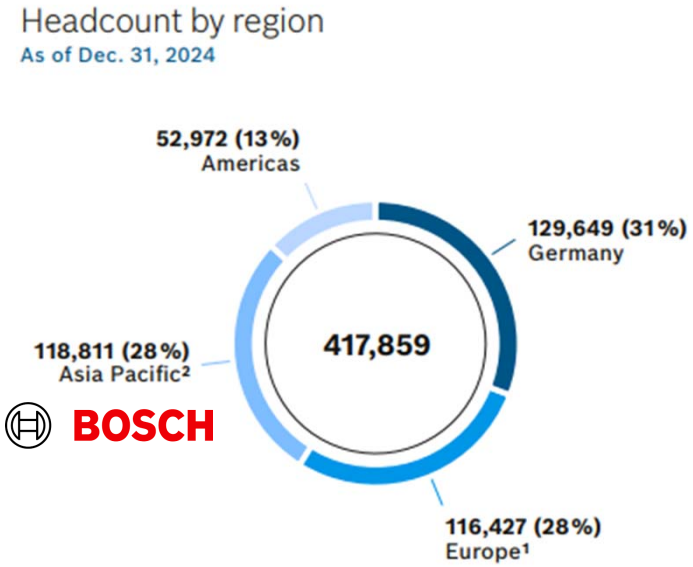
Featuring:

rexroth
A Bosch Company

Mobile Compact Directional Valves

Concept, products and applications

Intro
Bosch Rexroth Australia



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~34,000 associates globally

Australia: ~300 associates

Head office in Sydney + 7 branches

Our Australian Locations

Established in 1987, Bosch Rexroth Pty Ltd is a leading force in the Hydraulic, Industrial Automation and Service industries, with 8 strategic Australian locations, servicing mobile and industrial customers.

Australian Corporate Office
3 Valediction Rd
Kings Park NSW 2148

Mobility Solutions

Industrial Technology

Energy and Building Technology

Consumer Goods

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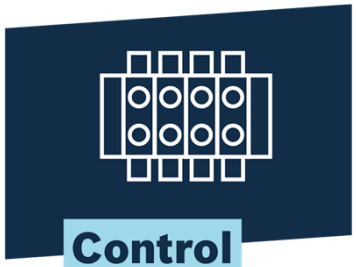
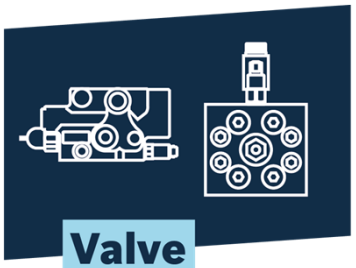
Mobile Control
Overall product group

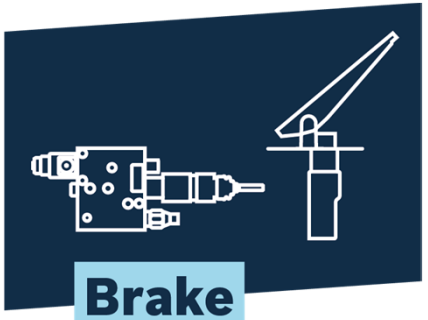


Control blocks



Valve modules

Pilot control devices



Brake valves

Mobile Components

Compact Hydraulics

MCO Product Overview

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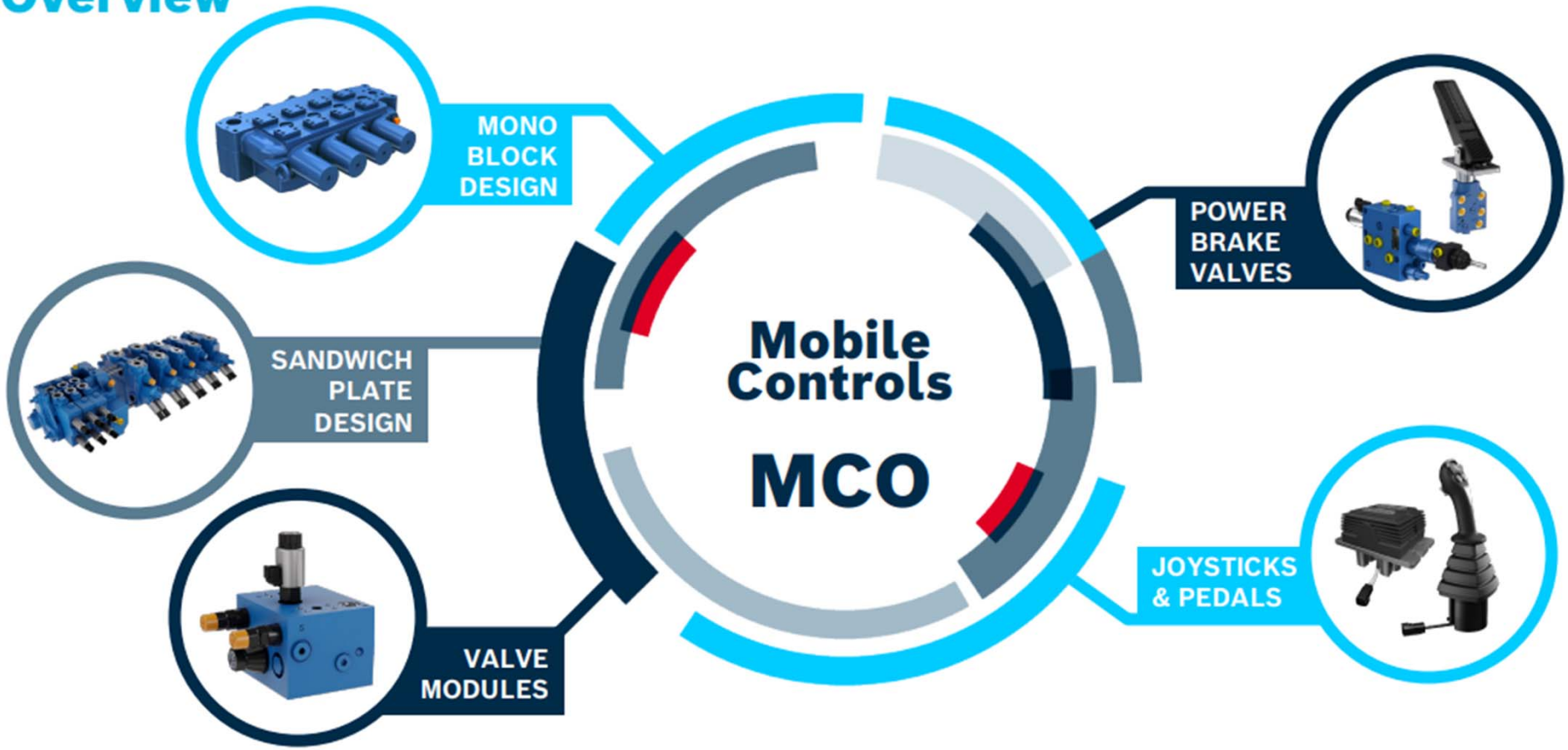
Product Portfolio MCO
Overview



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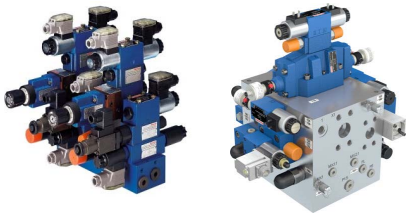
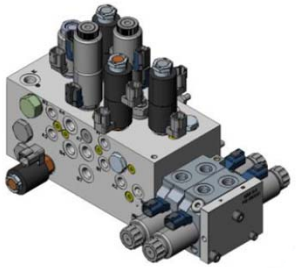
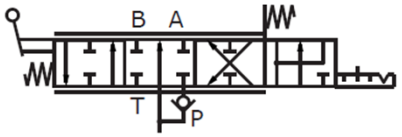
Basic concept of directional control Industrial and Mobile

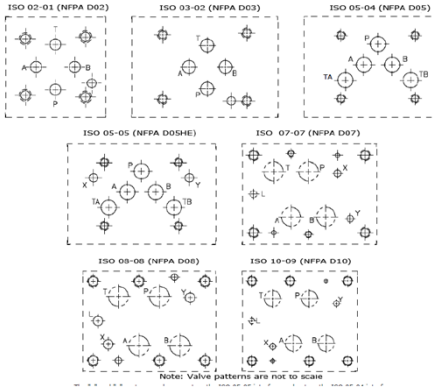




Mobile application

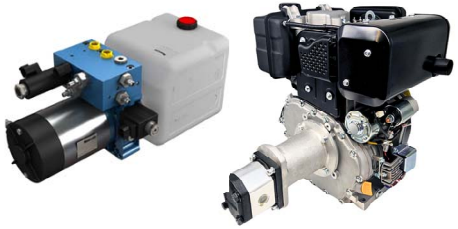
- Sectional
- Monoblock
- Custom manifold





Industrial application

- Cetop interface



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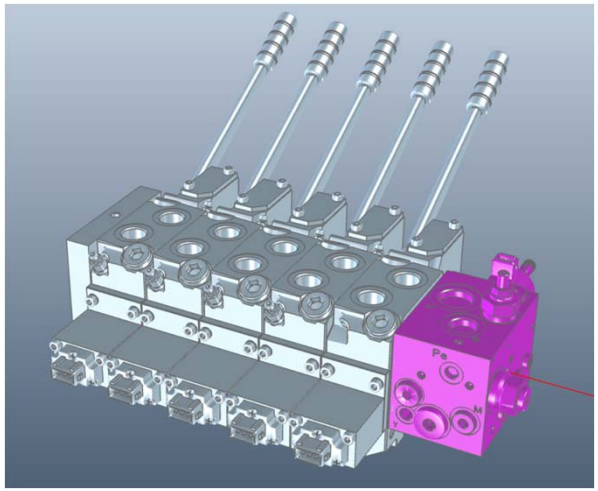
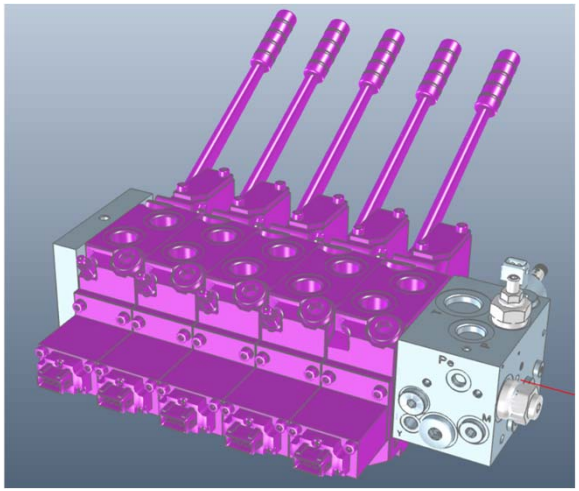
Basic concept of directional control
Conventional sectional mobile valve



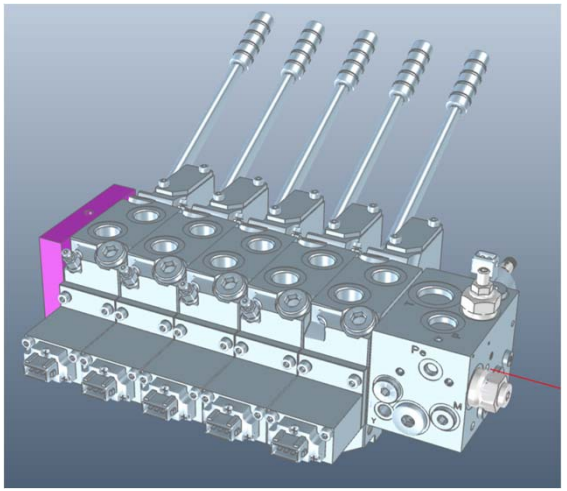
Inlet

- Pressure, Tank connections
- LS management
- Monitoring
- Other functions e.g pump unloader



Working Sections

- A and B connections
- Pressure functions
- Hold load
- LS management
- Monitoring



End Plate

- Interconnections
- Monitoring

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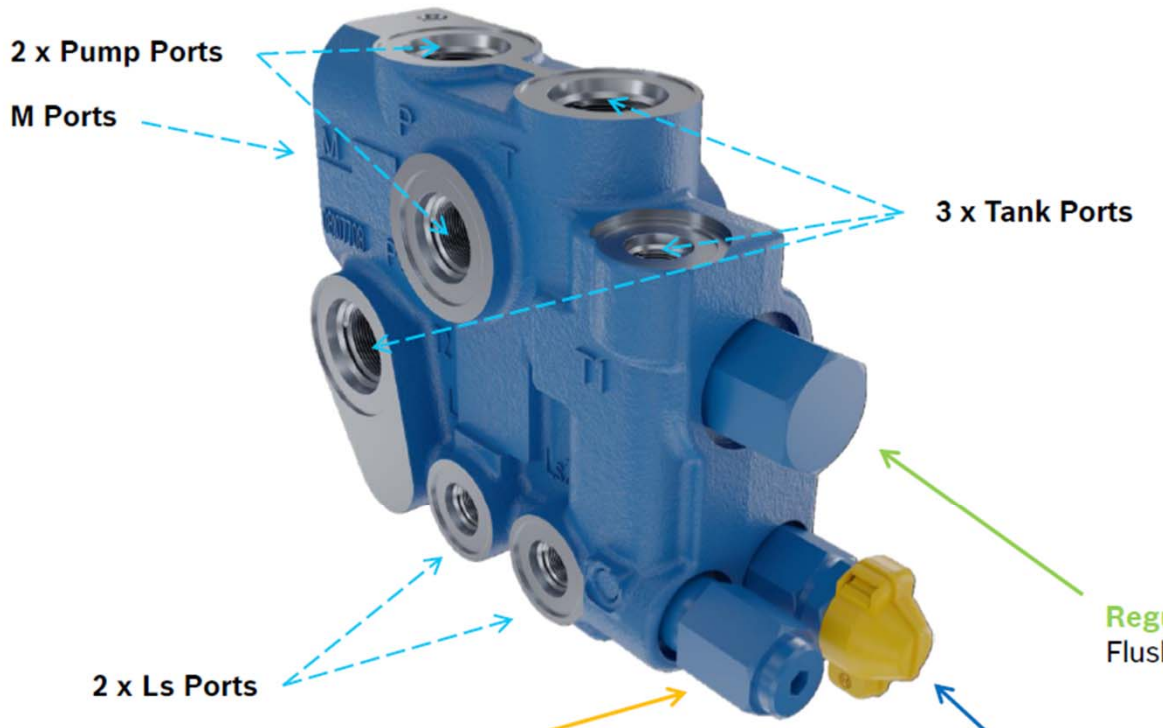
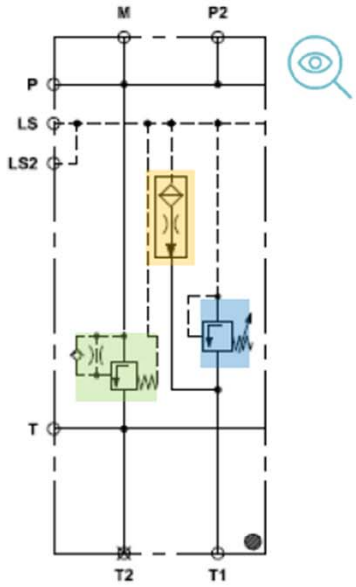
Overall concept of hydraulic control
Example of inlet capabilities

- **Same inlet for**
  Hydraulic sections
  EH sections
- **Regulating unit**
  Flushing valve
  or Open Center inlet
- **Drain**
  Internal or external drain





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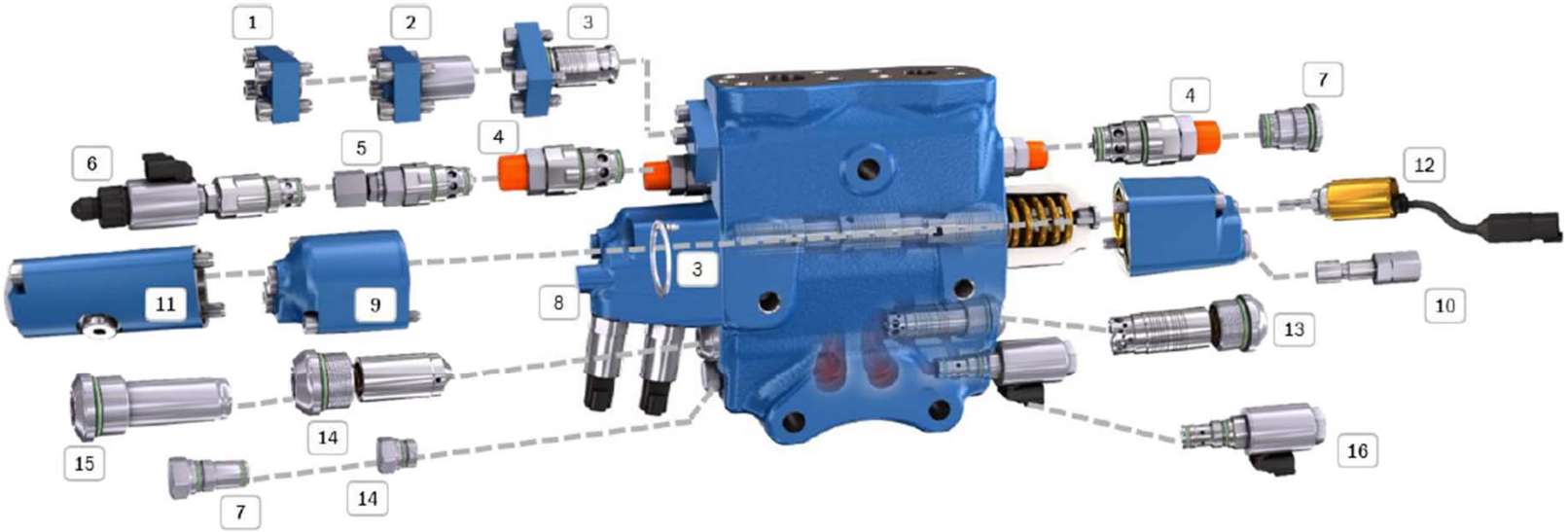
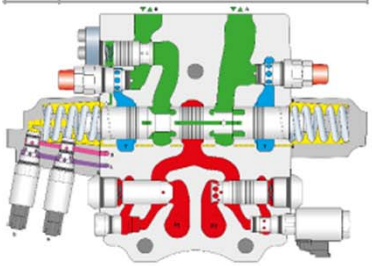
Overall concept of hydraulic control
Example of working section capabilities



1	Anti drift valve + measuring port
2	Anti drift valve downgrade-kit
3	Anti drift valve pilot + main stage
4	Pressure relief + anti-cav.
5	Pressure relief + hydraulic Adj.
6	Pressure relief + el. prop Adj.
7	plug
8	Electrohydraulic actuation
9	Hydraulic actuation
10	Mechanic strike limiter
11	Hydraulic stroke adaption
12	Position sensor
13	E-Valve main stage
14	E-Valve check valve
15	E-Valve plug
16	E-Valve pilot stage



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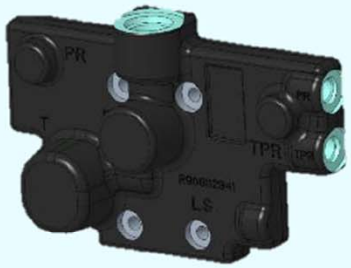
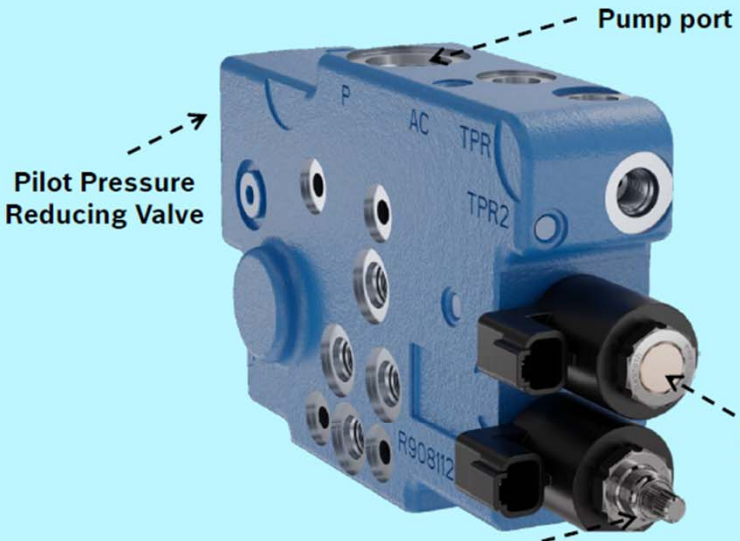
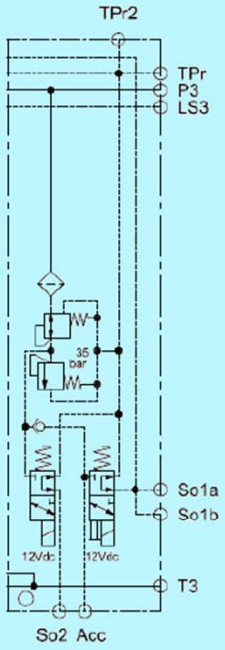
Overall concept of hydraulic control
Example of end plate capabilities
EH outlets

Outlet : P, T
With Pr and Tpr channels



Outlet : PRV and Shut Off
With Pr and Tpr channels





Pilot pressure reducing valve: 31 or 35 bar
Shut Off: 1 or 2 shut Off valves - 12V or 24 V
Optional: primary relief valve

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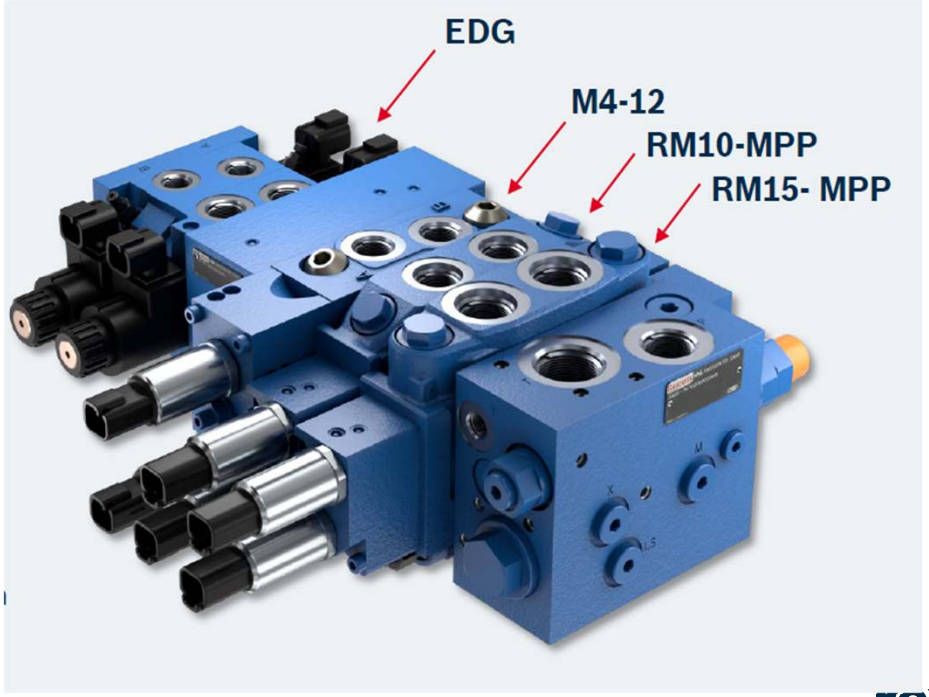
Mobile Control
Control Blocks range of products

Load Sensing Control Blocks
- M4
- SP-08
- SB11
- SB24/34
- RM10/15
- RM Global
- **ED/EDG/EDH**

Open Center Control Blocks
- MO
- M1
- M8
- SM12

Load sharing LUDV Control Blocks
- M6
- M7
- RS
- SX
- **EDC**

Closed Center Control Blocks
- RCS



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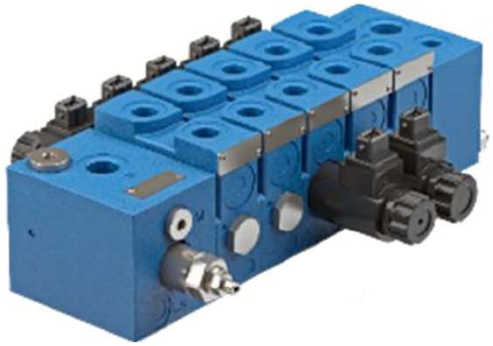
COMPACT DIRECTIONAL VALVE
OUTLINE

- **Introduction to CDV**
- **Product families:**
  - ED
  - EDC
  - EDG
  - EDG-OBE
  - EDH
  - EDH-OBE
  - Flow Diverters (circuit selectors)
  - Stand alone valves
  - Spool monitoring sensor
- **New project + CHoose**



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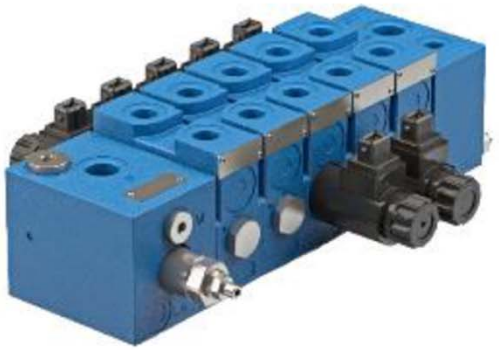
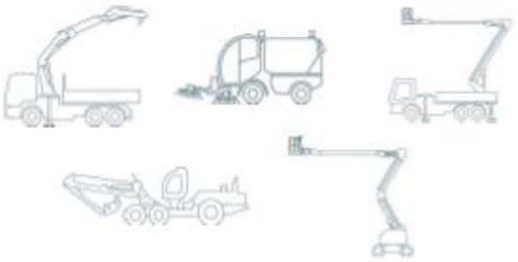
COMPACT DIRECTIONAL VALVE

Why bankable valves?

Technical advantages

- Common mounting interface to assemble together different «slices» in terms of size and configuration
- Possibility to manage high flow working sections
- Less sensible to oil contamination
- Wide portfolio of auxiliary features like emergency lever, pressure relief, anti cavitation and/or LS relief on ports, modular elements
- Easy and flexible configurable products





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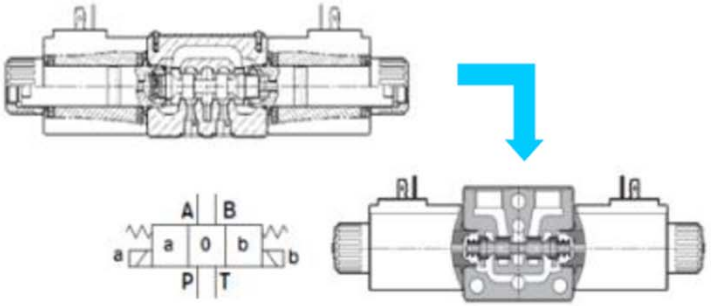
COMPACT DIRECTIONAL VALVE

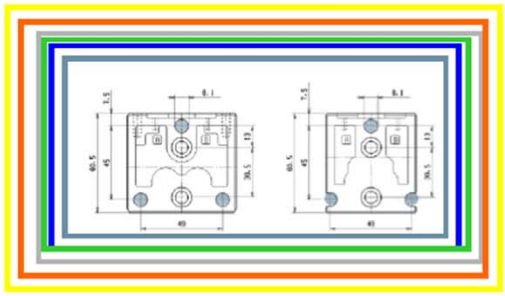
Why bankable valves?

From CETOP Concept....



...to bankable Concept

Common mounting interface



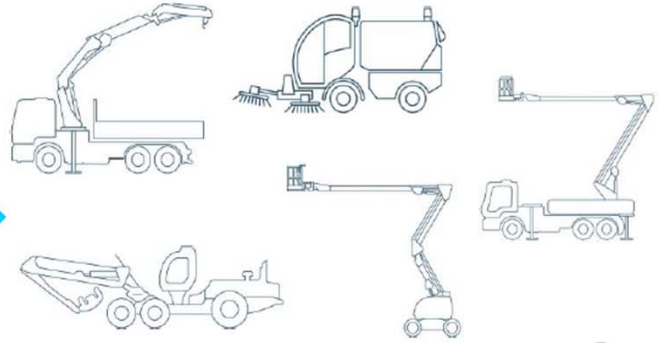
Flexibility and Modularity:

Easy to configure tailored solutions
thanks to wide products portfolio

BEST FIT SOLUTIONS!

Dealers and System integrators oriented:

Stock of hydraulic solutions for multiple applications



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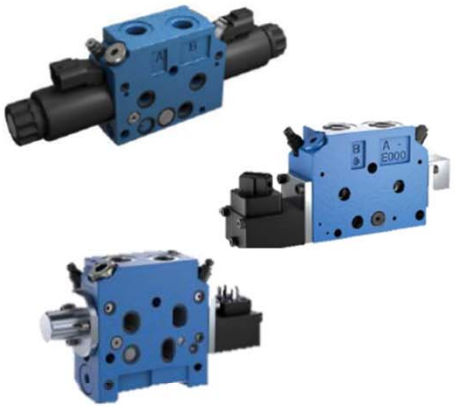
COMPACT DIRECTIONAL VALVE

Overview of sectional valves for mobile machines

ED_

- Not compensated or flow sharing
- Up to 80 lpm / 21.2 GPM
- 310 bar working pressure
- Direct actuation
- Optional: LS, Manual actuation,...

EDG - EDH



- Pre compensated LS
- Up to 100 lpm / 26 GPM
- 350 bar working pressure
- Direct or EH actuation
- CBV or PO Check optional

M4-12

- Pre compensated LS
- Up to 150 lpm / 40 GPM
- 280 bar pump pressure
- EH or H pilot
- WPRV, LS relief

RM-10/-15

Mobile Hydraulics products

- Pre compensated LS
- Up to 130 lpm / 34 GPM
- 400 bar pump pressure
- Actuation variations
- Wide assortment of accessories

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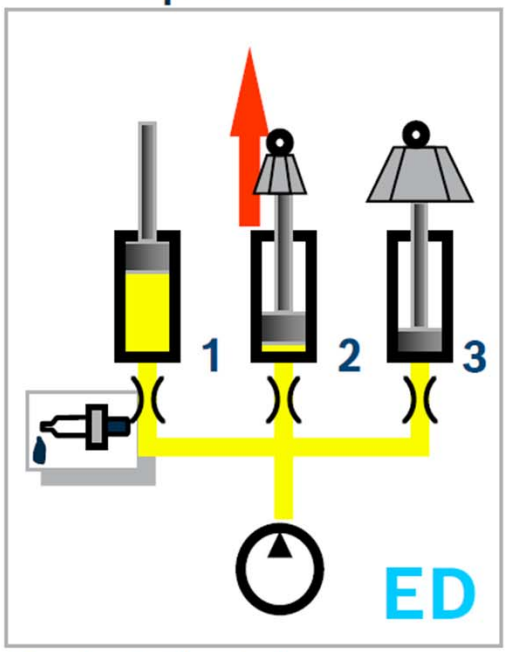
COMPACT DIRECTIONAL VALVE

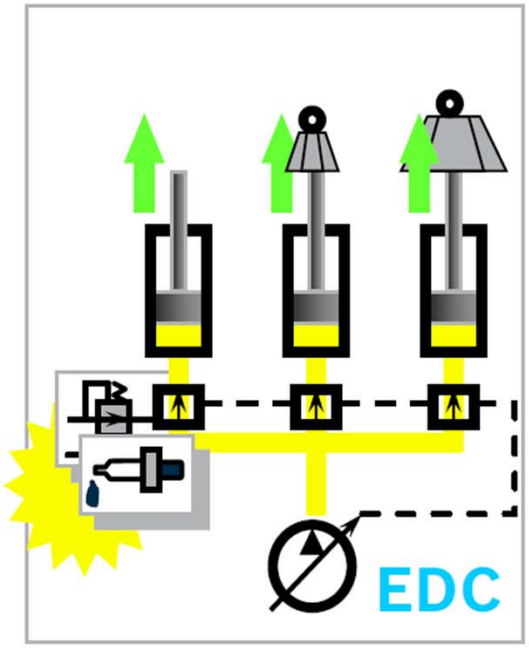
Open Center system – ED Overview

Open center



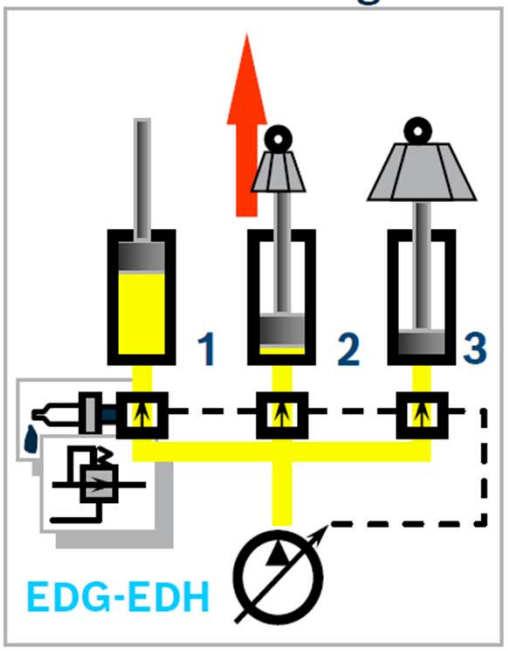
Standard: The simultaneous movements are allowed only in case of load pressures balanced. In case an operation needs a higher pressure the movement is stopped.

LUDV



Flow sharing: Even in case of saturation condition, the simultaneous movements are assured at different pressure range.

Load sensing



Load Sensing: The simultaneous movements are allowed till the system saturation; then the movement which needs the higher pressure will stop.

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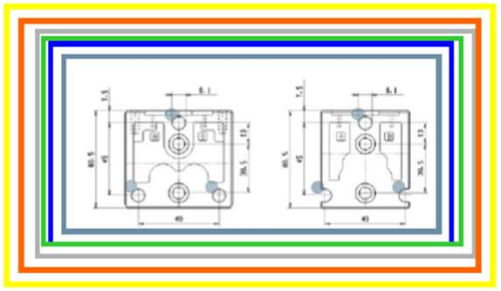
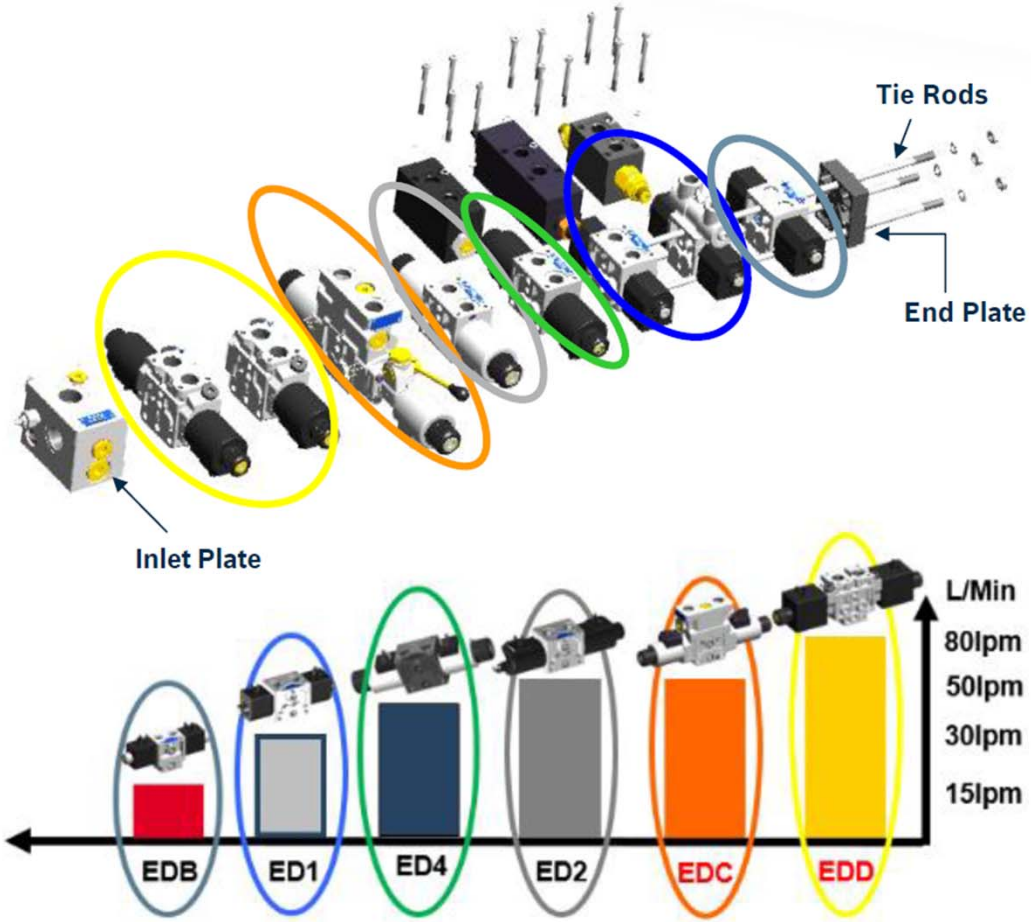
COMPACT DIRECTIONAL VALVE

Open Center system – ED Overview

Common mounting interface





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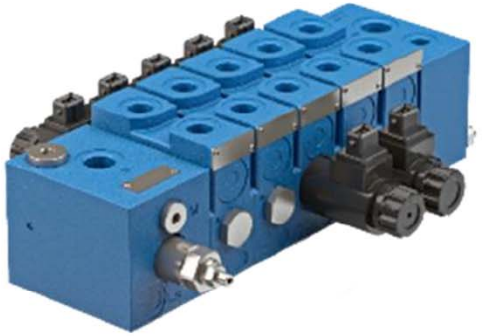
Next topic:

- Pre-compensated valve sections EDG



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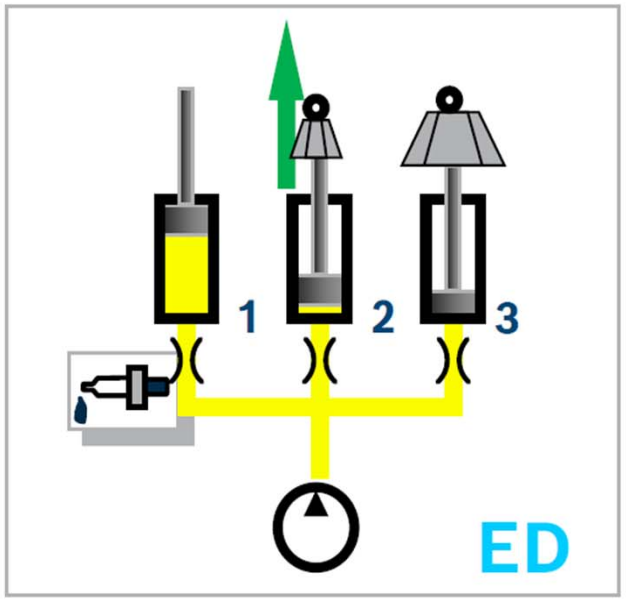
COMPACT DIRECTIONAL VALVE

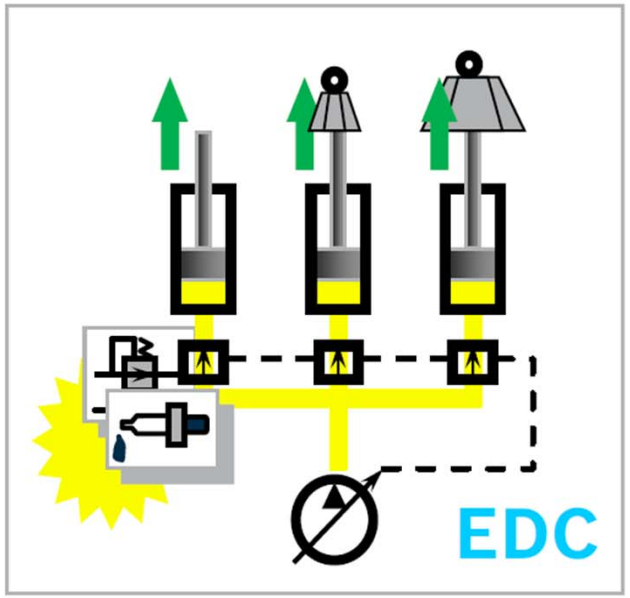
Pre-compensated system – EDG/EDH Overview

Open center



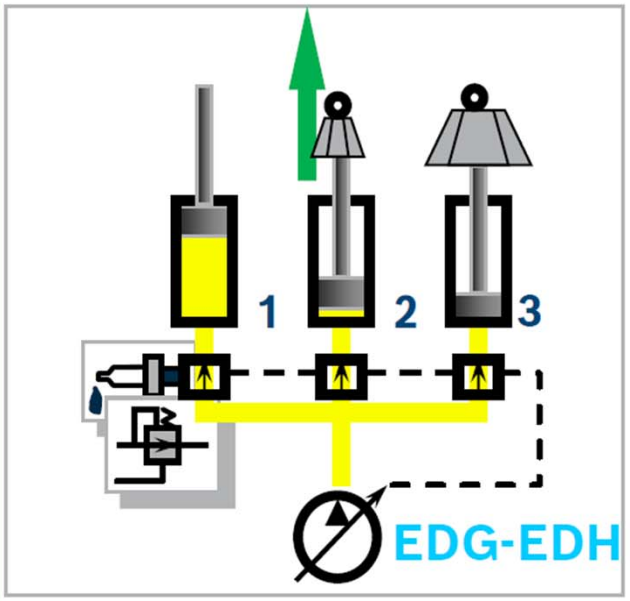
Standard: The simultaneous movements are allowed only in case of load pressures balance. In case an operation needs a higher pressure the movement is stopped.

LUDV



Flow sharing: Simultaneous movements are assured at different pressure ranges, even in case of saturation condition.

Load sensing



Load Sensing: The simultaneous movements are allowed until system saturation; then the movement which needs the higher pressure will stop.

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COMPACT DIRECTIONAL VALVE

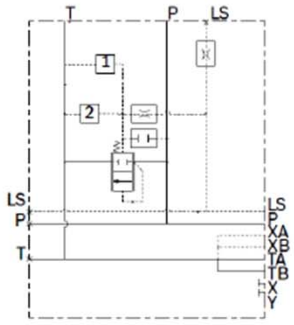
LS pre-compensated - EDG

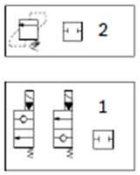
TEG-13

Open Center lateral Inlet Plate with option

OC, Gear pump configuration

CC, variable displacement pump

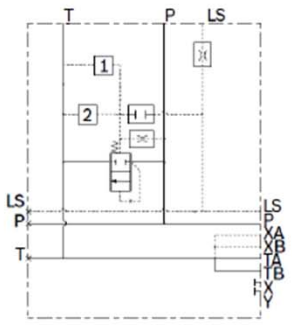




PRV

VEI

Side EDG



Side EDG

Technical data

Maximal Flow per slice	Up to 120 l/min
Main pressure compensator	12 bar (up to 18 bar)
Maximal working pressure on P	350 bar

Characteristics

- Integrated Main pressure compensator
- Suitable for Open Centre Circuit or Close Centre Circuit
- Easy change from OC into CC, by screw locker on compensator
- LS signal,
- LS emergency function Cut Off by electrical cartridge NO
- Ports: P-½" T-¾" | P-SAE10 T-SAE12

Features and optional

- Main Features:
  - Inlet plate for gear pump or variable disp. pump
  - Integrated LS Relief Valve
  - Integrated LS cut off, 2/2 VEI On-Off valve, NO or NC
- Option:
  - Primary Relief Valve integrated (alternative to LS relief)
  - Pressure reducing Valve (for EDG E.H.)
  - Low pressure stand-by stage external module

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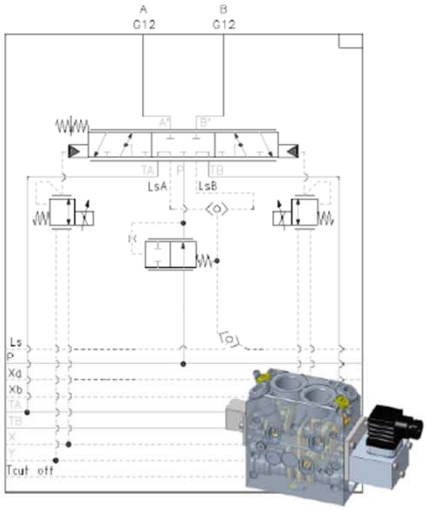
COMPACT DIRECTIONAL VALVE

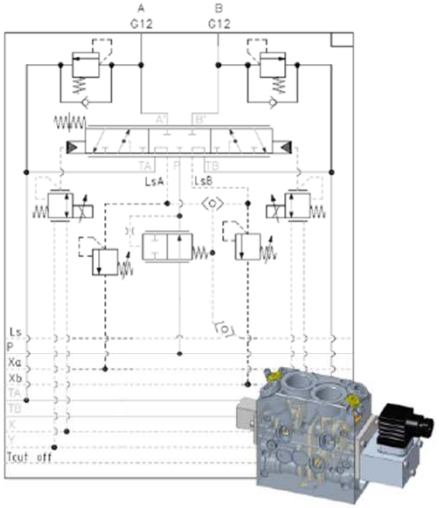
LS pre-compensated -EDH

Local LS management

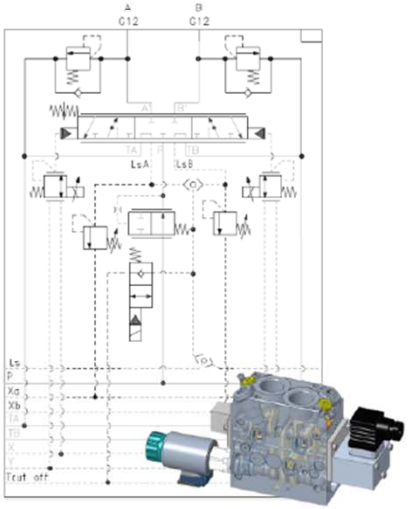
Basic Version



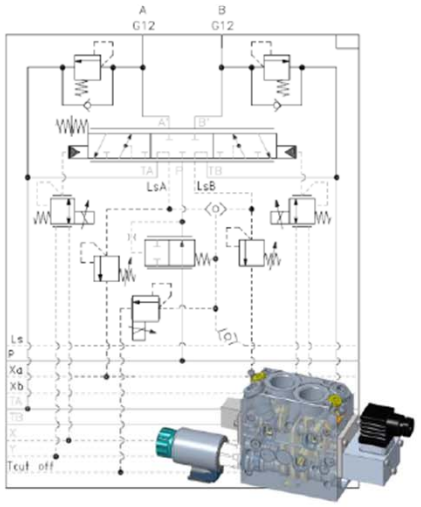
Aux valves on board



LS cut-off



Pressure control



All the combinations, starting from single casting model

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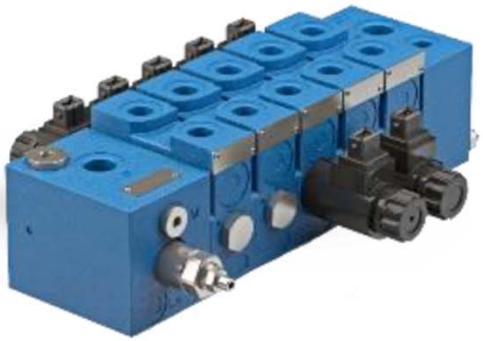
COMPACT DIRECTIONAL VALVE

LS pre-compensated - EDG

Compact version

Extended version

EHPiloted version



Technical data

Inlet maximal Flow	120 l/min
Maximal flow per slice	60 l/min @ 11 bar*
Maximal working pressure	350 bar

*electro-hydraulic actuation

Characteristics

- LS block with Pre-compensated concept
- Integrated function
  - Anti shock
  - LS relief on LSA and LSB
  - Po Check valve (extended version)
  - Counterbalance (extended version)

Features

- Compliant with CDV concept of modularity and flexibility
- Highly configurable solution
- Compact version with smallest dimension and weight in the range, regardless working pressure.
- Extended version, with integrated load holding function
- New solenoid concept, with high temperature rating
  - Proportional, Pole tube and Coils with Zinc-Nickel coating
  - On-Off is using D36 coils, with new pole tube design

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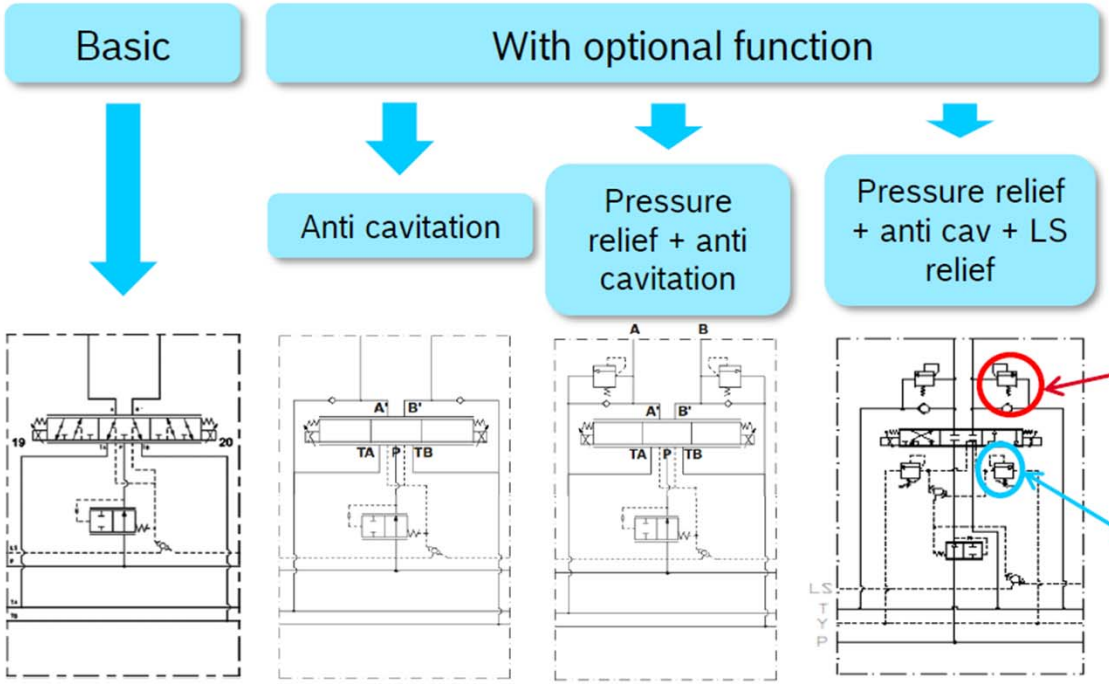
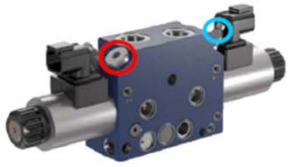
COMPACT DIRECTIONAL VALVE

LS pre-compensated - EDG

Compact Version





VMA1.025

VMLS

New design

Technical data

Maximal Flow per slice	40 l/min
Local pressure compensator (std)	6 bar
Maximal working pressure on P – A - B	350 bar

Characteristics

- Pre-compensated section
- Local compensator std. set 6bar (option 4bar, or w/out compensator)
- Direct acting control
- Proportional EDG-DP or On-Off (D36) EDG-DO
- LS signal
- Emergency lever override

Features and optional

- Optional:
- VMA Anti shock, Pressure relief valve with fix setting within anticavitation function on A and/or B
- VUM, anticavitation valve on A and/or B
- VM-LS, cut of pressure on LSa and/or LSb, adjustable VM-LS relief valves, on A and B adjustable up to 350bar
- Spool position sensor available on request

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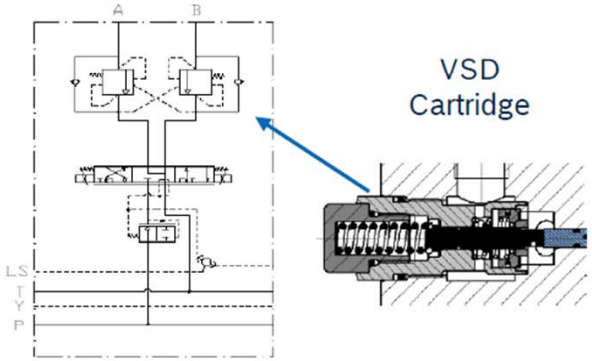
COMPACT DIRECTIONAL VALVE
LS pre-compensated - EDG

Extended Version

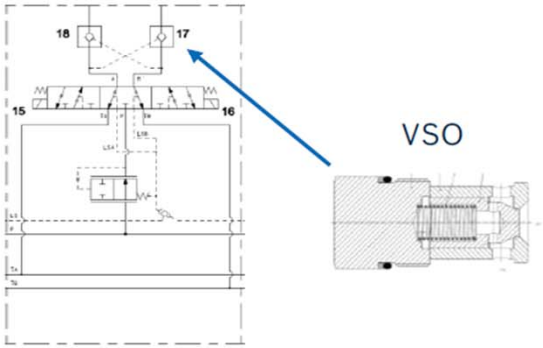
With optional function

Overcenter valve



VSD Cartridge

Po Check valve



VSO

Technical data

Maximal Flow per slice	40 l/min
Local pressure compensator (std)	6 bar
Maximal working pressure on P – A - B	350 bar

Characteristics

- Pre-compensated section
- Local compensator std. set 6bar (option 4bar, or w/out compensator)
- Direct acting control
- Proportional EDG-DP...B1 / EDG-DP...R1 or On-Off EDG-DO...B1 / EDG-DO...R1
- LS signal
- Emergency lever override

Features and optional

- Sectional valve with integrated Overcentre valve VSD,
  new cartridge style design in special cavity,
  fix setting pressure up to 350bar,
  available single or double on A-B,
  Pilot ratio 4:1
- Sectional valve with integrated PO Check valve VSO,
  new PiB design in special cavity,
  cracking pressure <1 bar, pilot ratio 4:1
- Spool position sensor available on request

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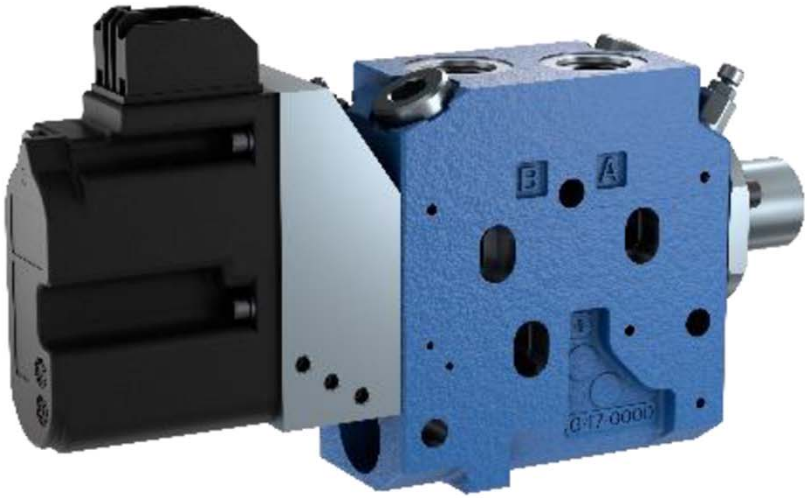
COMPACT DIRECTIONAL VALVE

LS pre-compensated –EDH-OBE

Technical data

Maximum flow: 100 l/min

Maximum working pressure: 350 bar



Features

- High Flow Capacity: ideal for drilling machines, cranes, construction equipment, and more.
- Modularity & Compatibility: Integrates seamlessly with EDG range and all our Compact Directional Valves platform.
- Compact Design: easy installation in machines with limited space.
- Versatile Solutions: Customizable with many additional functions such as:
  - Antishock and anti-cavitation valves
  - LS reliefs A and B side
  - Lever actuation
  - LSA and LSB out, local LS cutoff, local pressure control
- Future-Proof Development: High reliability and reduced maintenance for optimized performance.
- Closed-Loop Control: Monitors and adjusts spool position for improved accuracy and stability.
- CAN Bus Compatibility: Easy plug-and-play with reduced load on the main controller.
- Fast Response: PID control and real-time adjustments for optimal performance.
- Enhanced Control: Supports autonomous functions for the next generation of machines.
- Increased Flexibility: Compatible with various auxiliary functions for adaptability.

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Next topic:

- Flow sharing valve sections EDC

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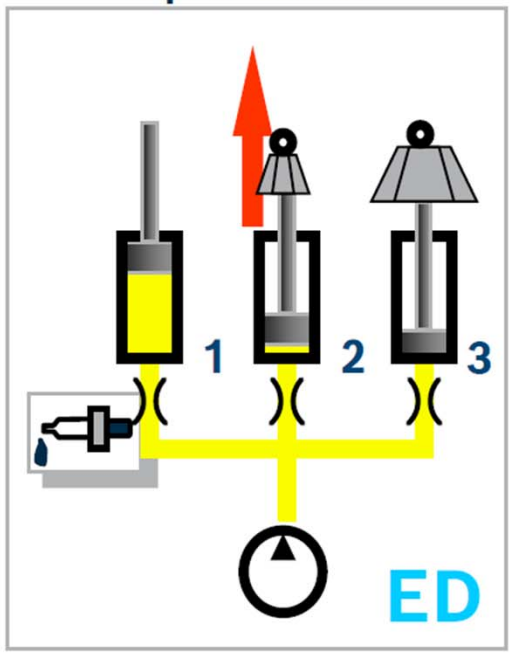
COMPACT DIRECTIONAL VALVE

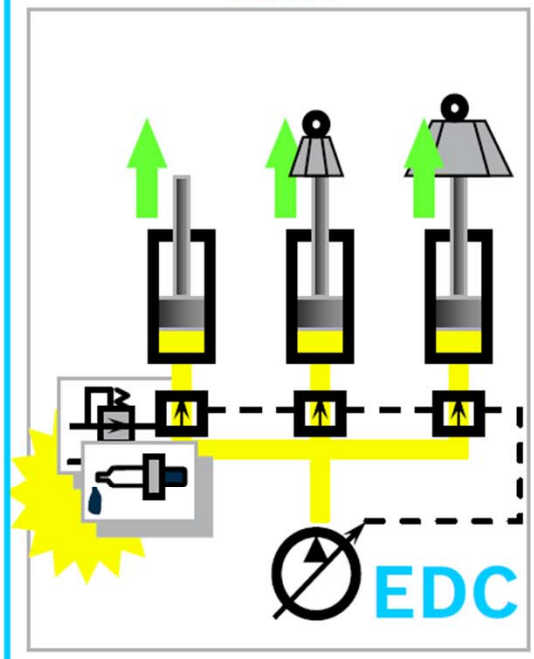
LUDV: Flow sharing System – EDC Overview

Open center



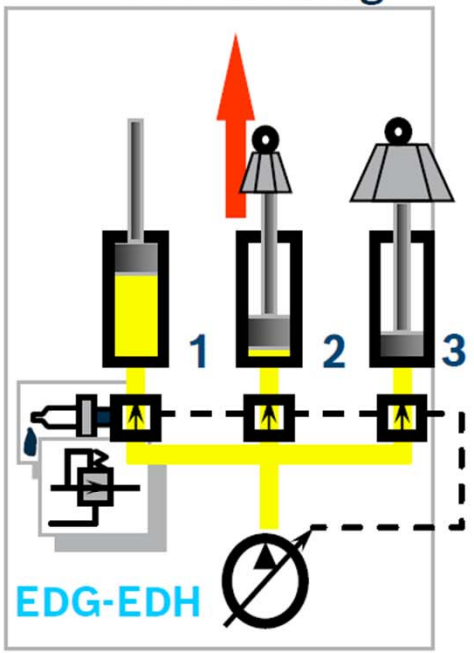
Standard: The simultaneous movements are allowed only in case of load pressures balanced. In case an operation needs a higher pressure the movement is stopped.

LUDV



Flow sharing: Even in case of saturation condition, the simultaneous movements are assured at different pressure range.

Load sensing



Load Sensing: The simultaneous movements are allowed till the system saturation; then the movement which needs the higher pressure will stop.

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COMPACT DIRECTIONAL VALVE

LUDV: Flow sharing System – EDC Overview

Directional Valves up to 65 L/min with flow sharing control (LUDV concept): On-Off and Proportional

Technical data

Inlet maximal flow :	120 l/min
Maximal flow per slice:	65 l/min
Maximal working pressure:	up to 310 bar

*direct actuation

Features

- Directional control valve size 6 with flow sharing system (LUDV). It's the ideal solution for small to medium size mobile equipment where simultaneous operation of different functions is a must or a plus
- Excellent flow management
- Simplification of the hydraulic circuit
- Flow sharing system to solve the saturation problems of load-sensing circuits
- Simultaneous movements allowed
- Available matching to all ED series
- Better control of boom and slewing
- Direct acting for better stability
- Possible hybrid solution if flow rate exceeds 80 l/min

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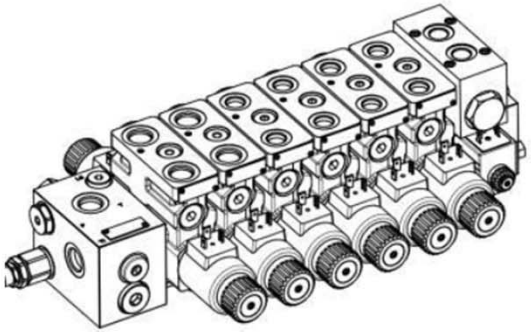
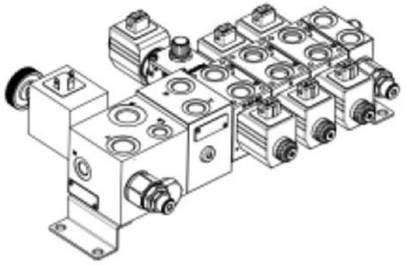
COMPACT DIRECTIONAL VALVE

Examples: ED+EDC valves

Assembly Blocks with mix of ED Elements





Target Markets

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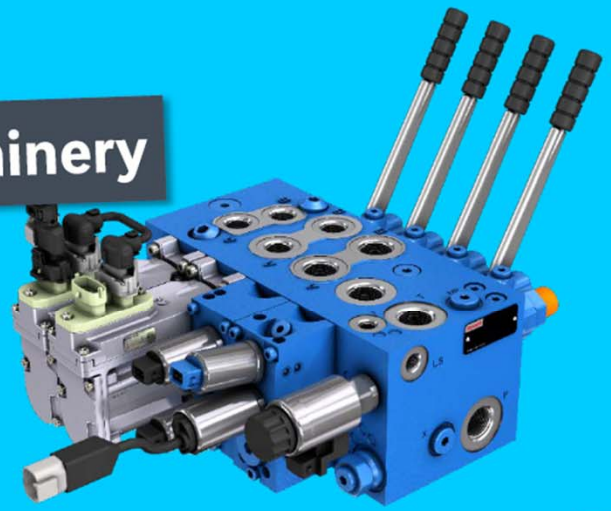
M4 valve series

Load Sensing Control Block for Mobile Machinery



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LS control blocks | M4 valve series

The M4 outperformances in many applications

Forestry machinery

Cranes

Teleforklifts

High-capacity forklifts

Knuckle boom cranes

Heavy duty vehicles

Municipal vehicles

Aerial work platforms

Marine engineering

Compu-Spread

Firefighting trucks

Stationary applications

Drilling equipment

Construction machinery

Mining applications

We have deep industry knowledge

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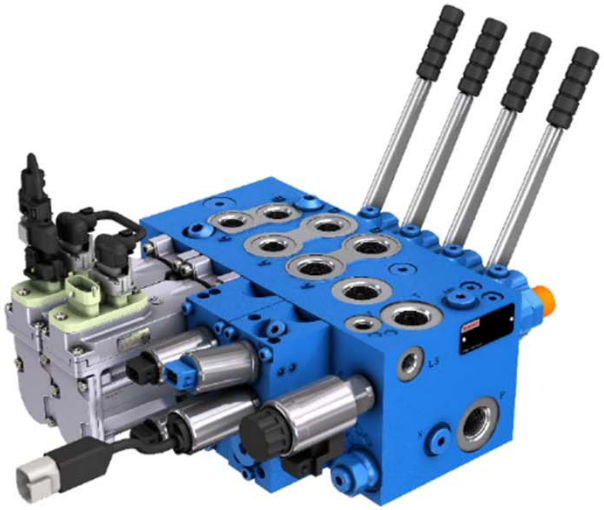
LS control blocks | M4 valve series
Technical overview as a general information



Technical data

- Nominal sizes 12, 15, 22
- Nominal pressure pump side 400 bar
- Nominal pressure consumer side 420 bar
- Max. Flow 130..150, 200, 600 l/min

Characteristics

- Efficient work in every application through precise, sensitive control and good fine control range
- Unique online configurator reduces development times and accelerates deliveries (www.boschrexroth.com/m4configurator)
- High reliability in operations thanks to proven quality and extensive experience in the field
- Easily accessible components and thoroughly considered modular system simplify maintenance and repairs
- CANbus Control with excellent precision and positioning speed (for M4-12 and M4-15)
- Security concepts for the machine up to PL_d acc. ISO 13849

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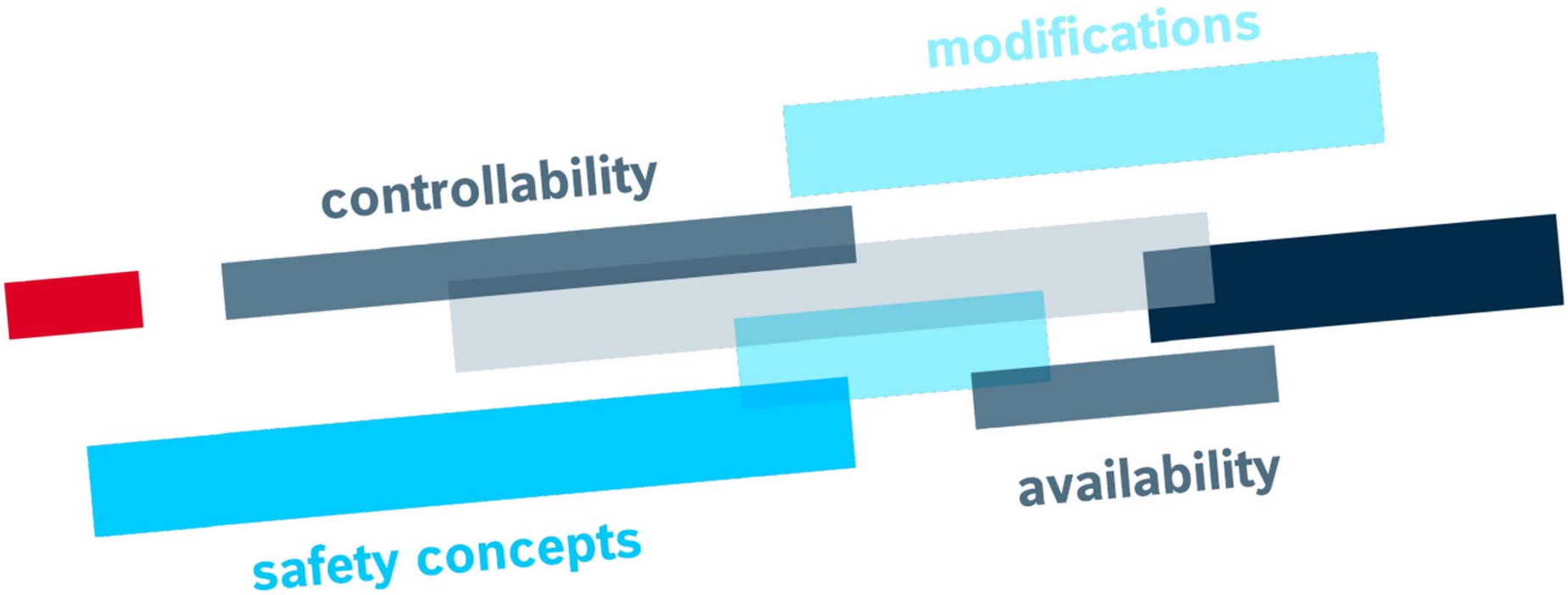
LS control blocks | M4 valve series
M4 is an outstanding valve



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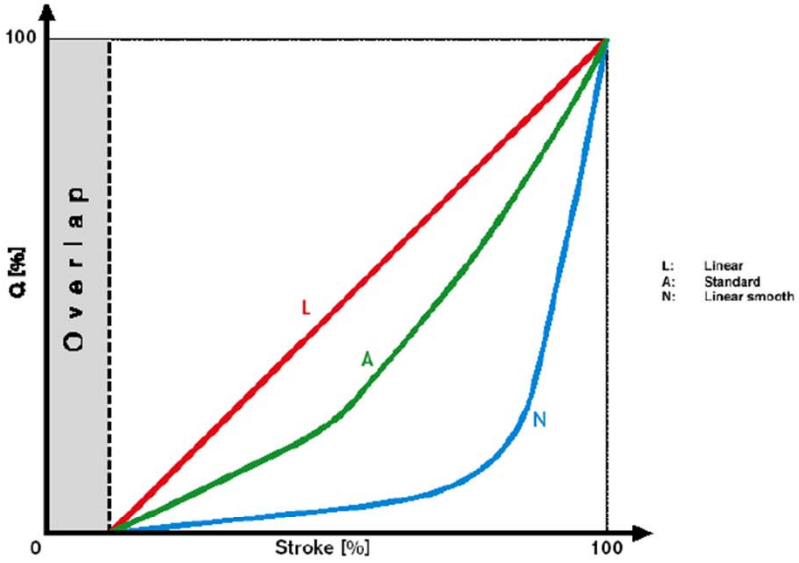
LS control blocks | M4 valve series
Controllability

- long stroke
- Special notch concept (linear, progressive, strongly progressive)
- Spool designs with back pressures are available
- Pressure control spool

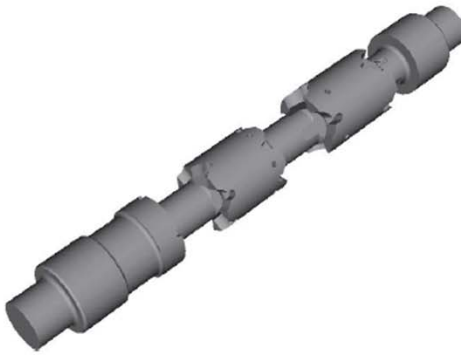
M4 valve series | Controllability

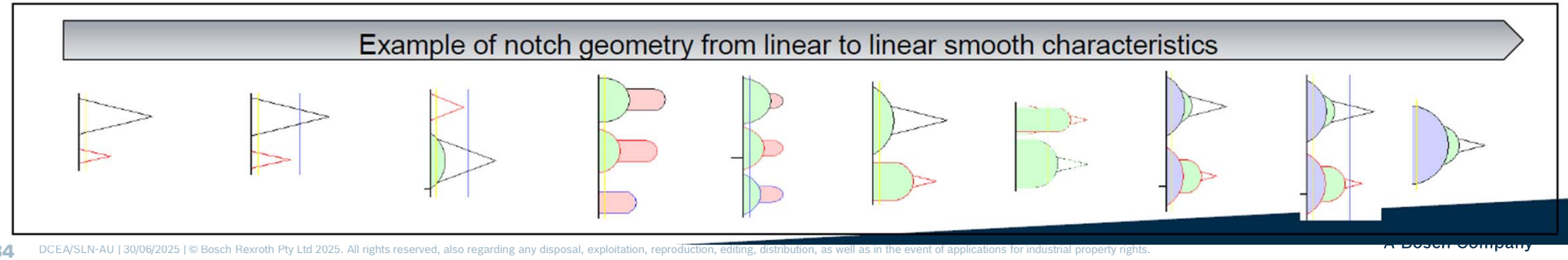
The spool determines the flow characteristics



The spool characteristics is determined by the notch geometry.

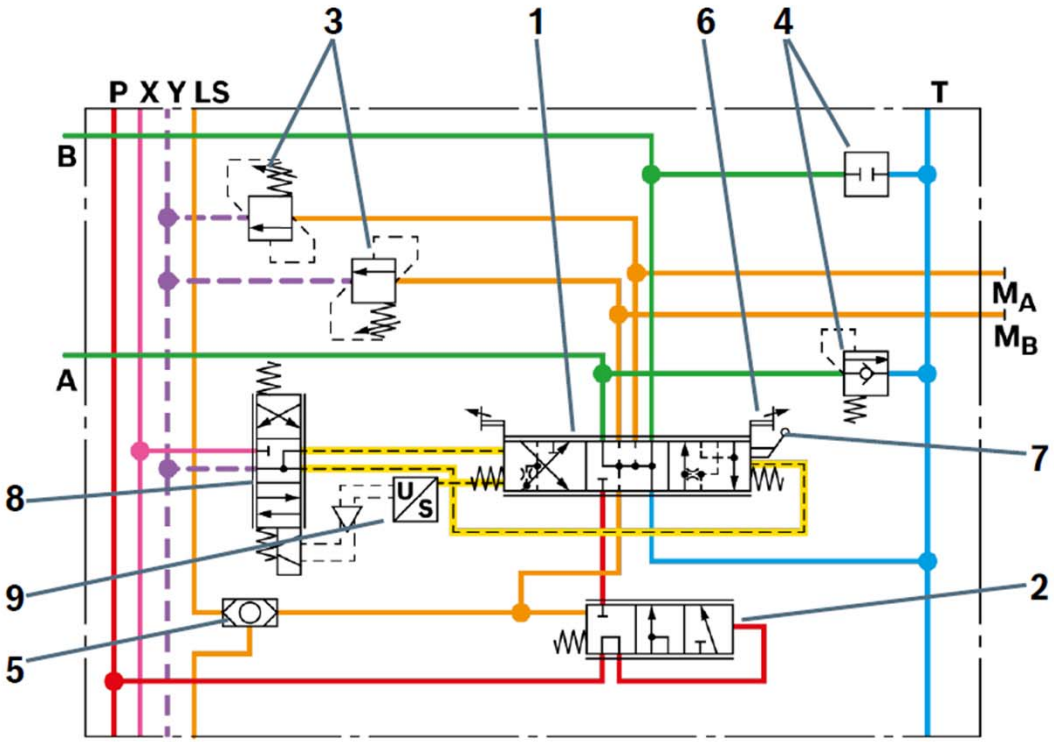
Individual adaptions to machine functions are possible upon request.





M4 valve series | Controllability

The actuation of the spool determines the precision



Connections

P	Pump
A, B	Actuator
T	Tank
X	Piloting oil supply
Y	Tank, pressureless
LS	Load Sensing
M_A, M_B	Measuring ports

Components

1	Control spool
2	Pressure compensator
3	LS-RV
4	Shock-valves
5	LS shuttle valve
6	Spring chamber
7	Manual lever
8	4/3 piloting valve
9	Spool position sensor

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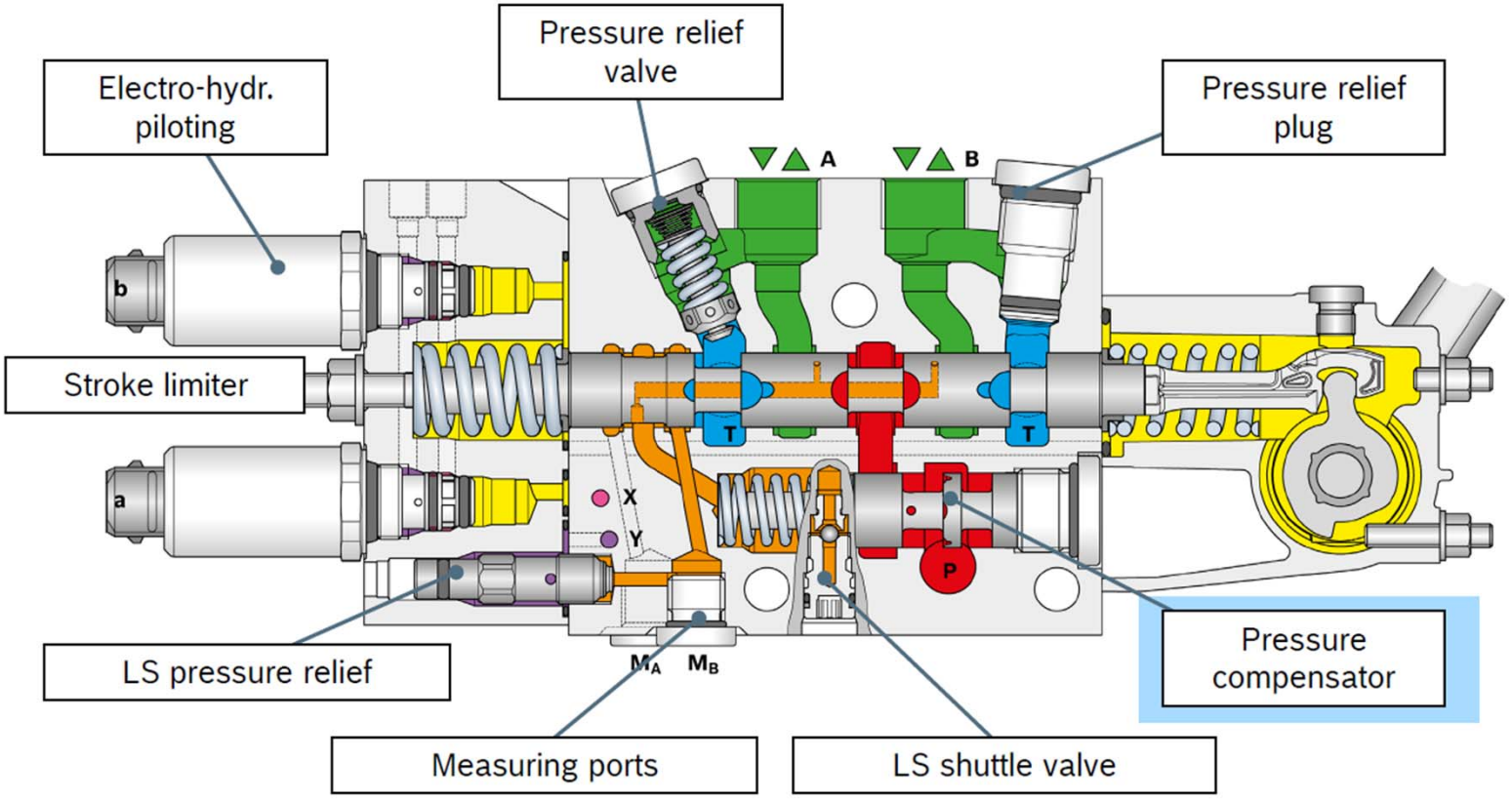
M4 valve series | modifications

M4-12 section overview | pressure compensator position



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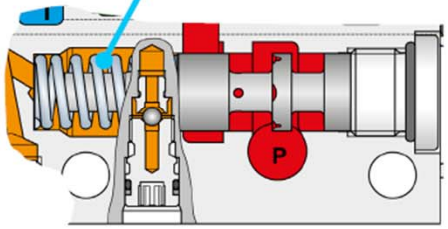
M4 valve series | modifications

M4-12 section overview | pressure compensator pressure settings



M4-12 △p (pressure compensator)		
0 shim :	up to	102 psi 7 bar
1 shim :	up to	138 psi 9,5 bar
2 shims :	up to	167 psi 11,5 bar

M4-15 △p (pressure compensator)		
0 shim:	up to	130 psi 9 bar
1 shim:	up to	145 psi 10 bar
2 shims:	up to	174 psi 12 bar

J SPOOL FLOWS

S OR C COMPENSATOR:	130	100	73	52	34	23	14	7	12 BAR 2 SPACERS
	120	85	65	45	30	20	12	6	10 BAR 1 SPACER
	100	70	57	38	26	17	10	5	8 BAR 0 SPACERS

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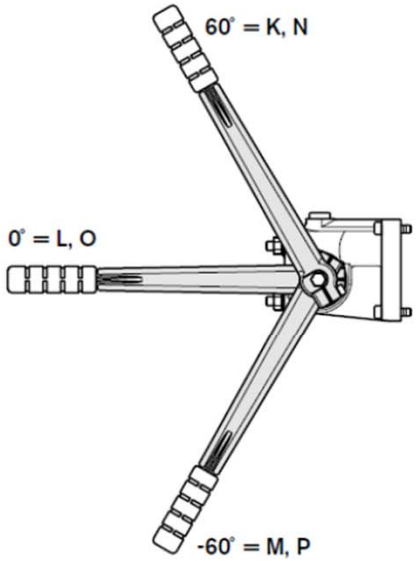
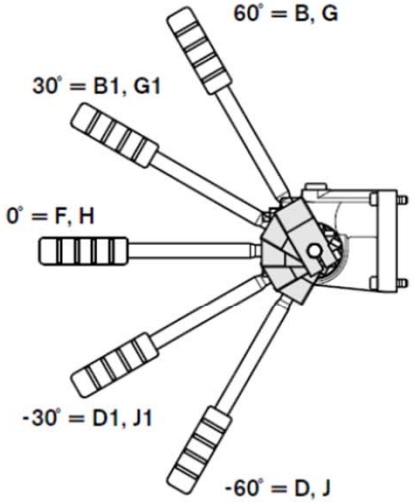
M4 valve series | modifications
Multiple lever versions allow fast changes

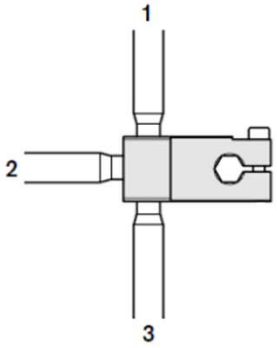
Standard lever



Clamping piece with lever
(example: lever screwing in Pos. 2)



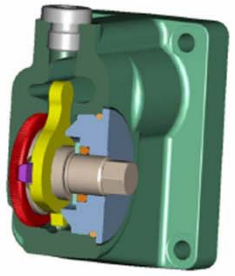
Lever screwing at the clamping piece



Mechanical cover

engaged

disengaged



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LS control blocks | M4 valve series
Safety concepts

- Internet configuration
- World-wide manufacturing and assembly sides
- International M-LOG partners

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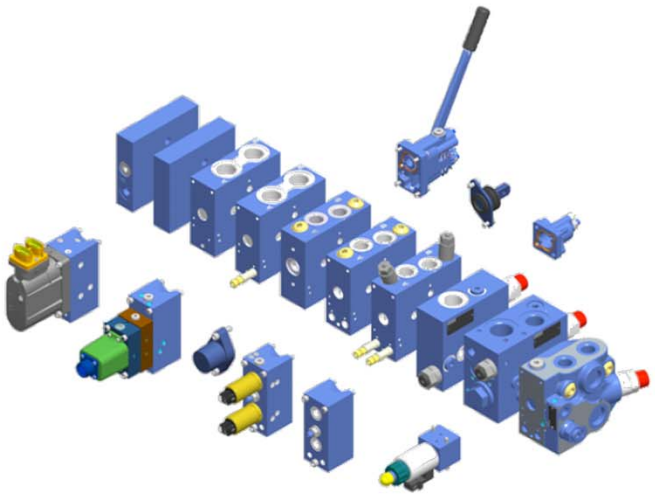
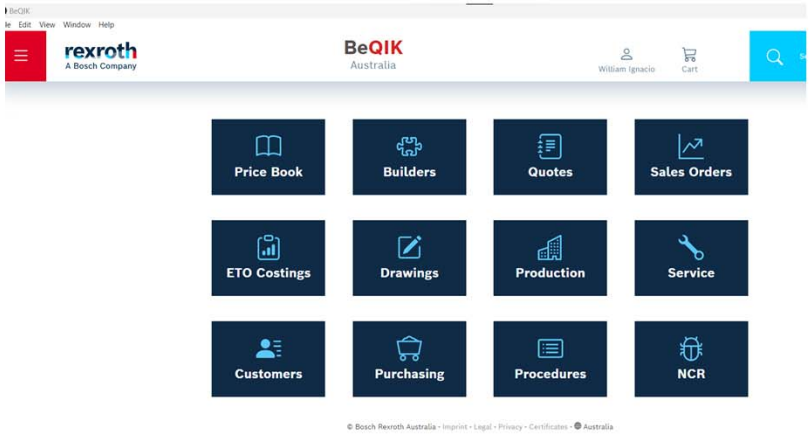
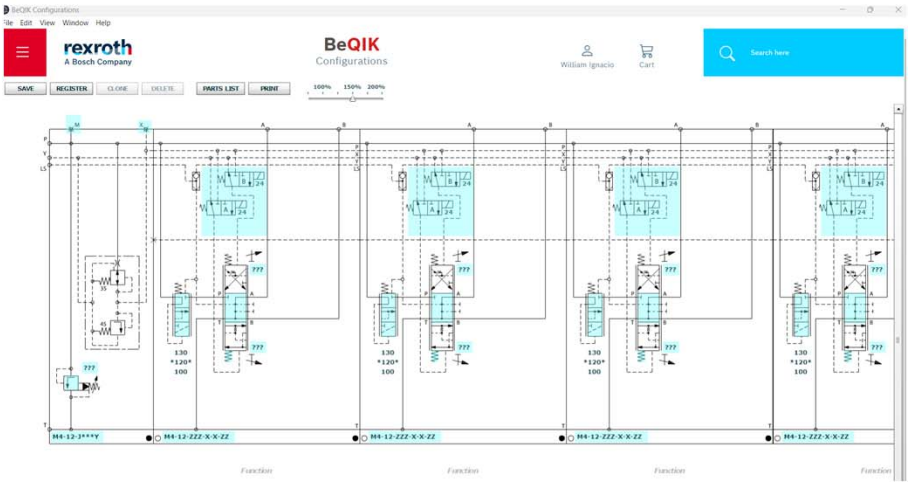
M4 valve series | availability
M-LOG program ensures quick deliveries when needed







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M4 & EDG

JOINING

RM MPP

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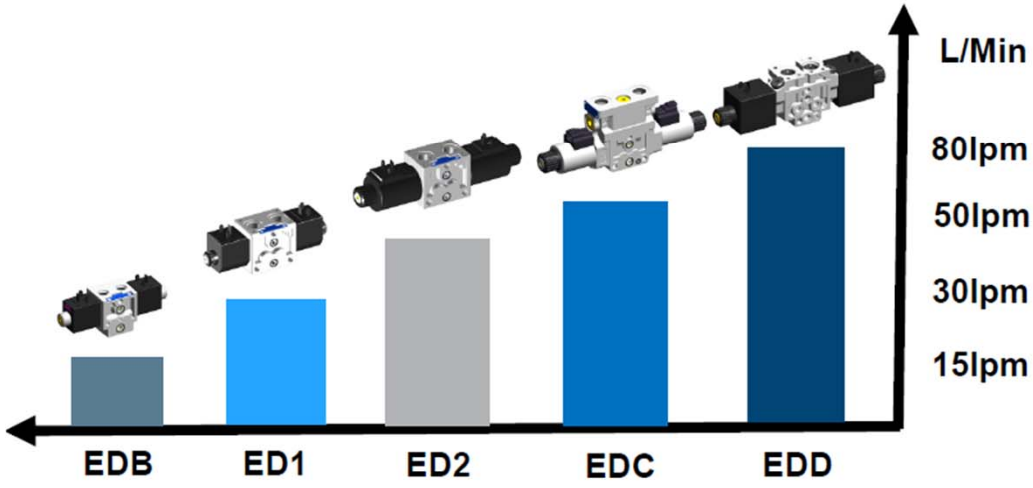
COMPACT DIRECTIONAL VALVE
EDG-OBE - EDH

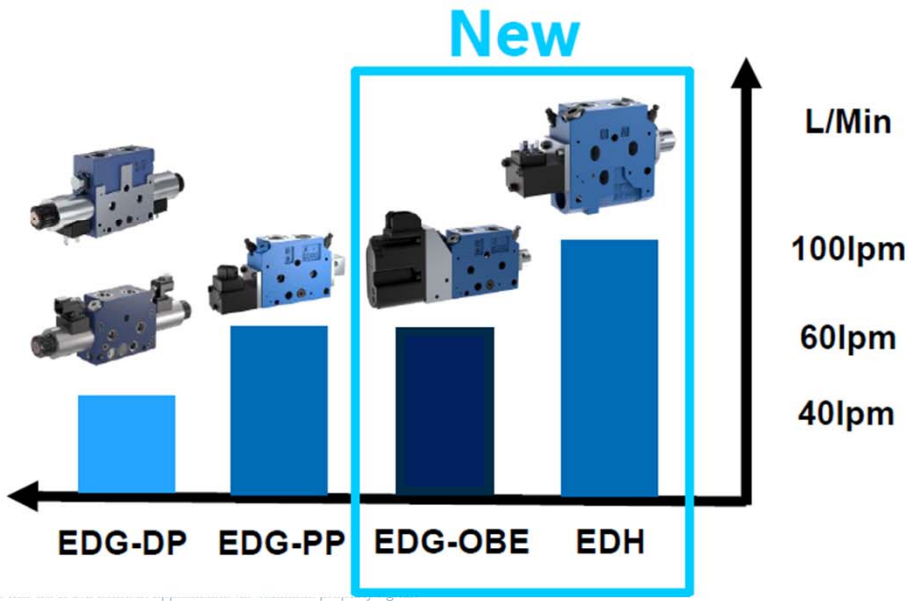
Modular Directional Valve

ED flange



Modular Directional Valve

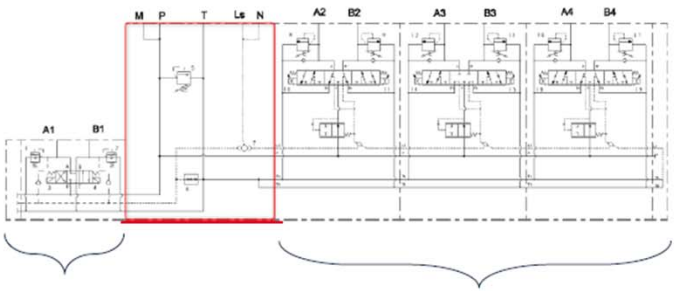
EDG flange

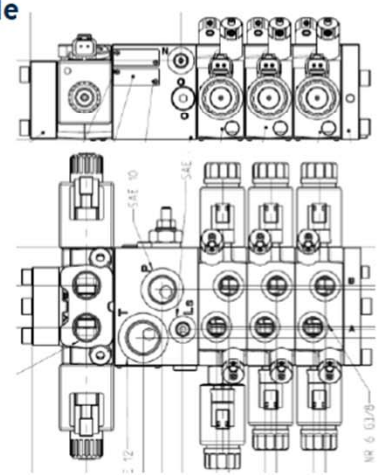


COMPACT DIRECTIONAL VALVE

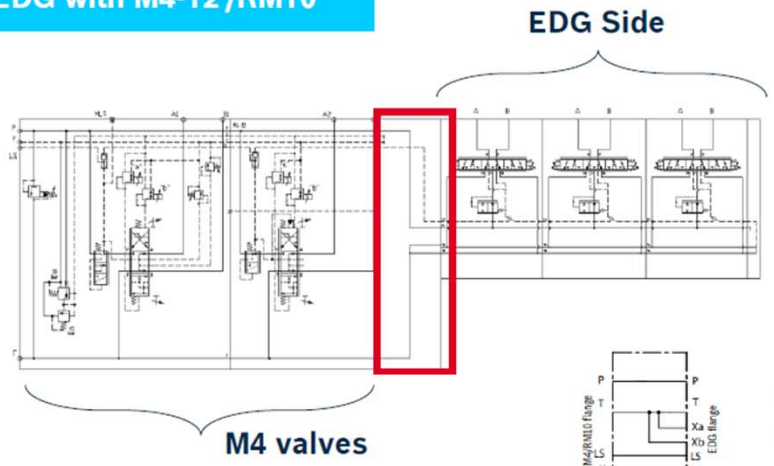
Intermediate plate with interface for EDG valves

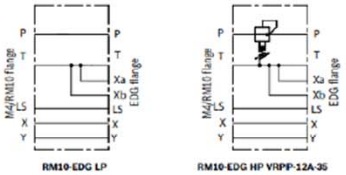
EDG with EDx | Customized solution

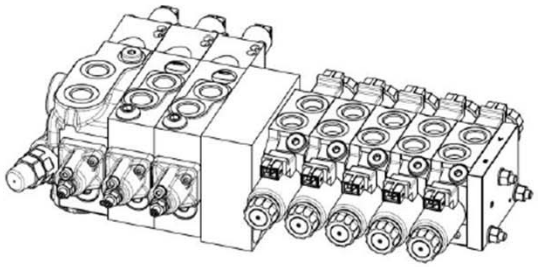




EDG with M4-12 /RM10







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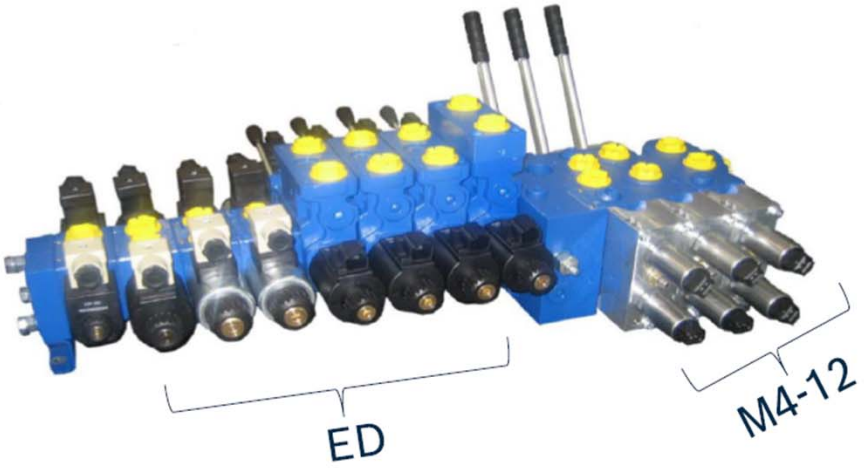
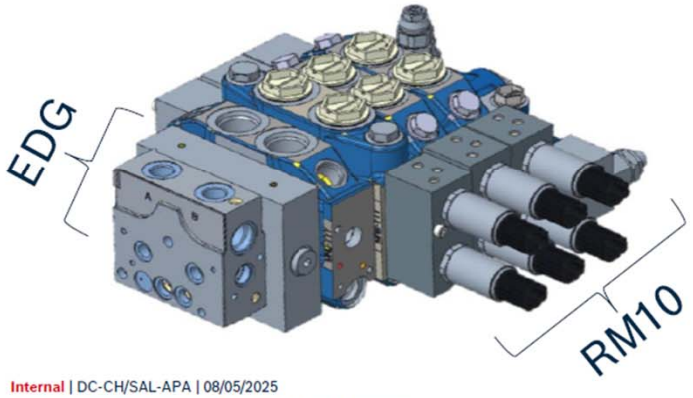
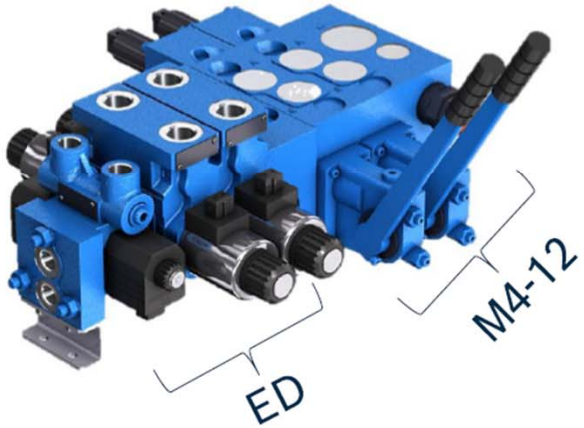
COMPACT DIRECTIONAL VALVE

Intermediate plate with interface for ED-EDG valves







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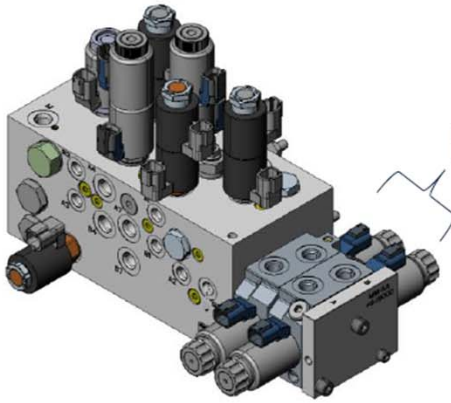
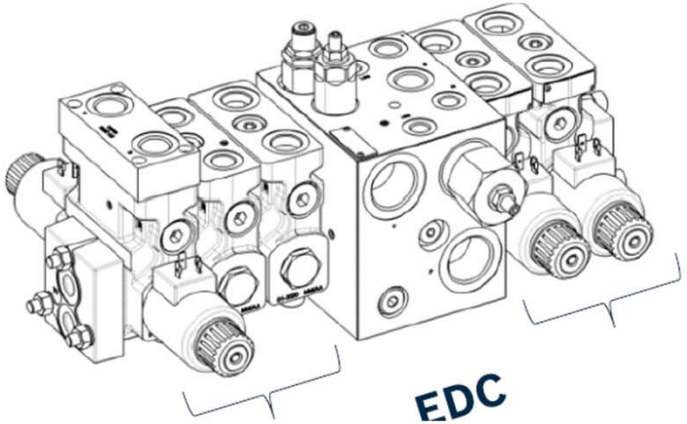
COMPACT DIRECTIONAL VALVE

Hybrid block with HIC / CPM + ED / EDG

HIC

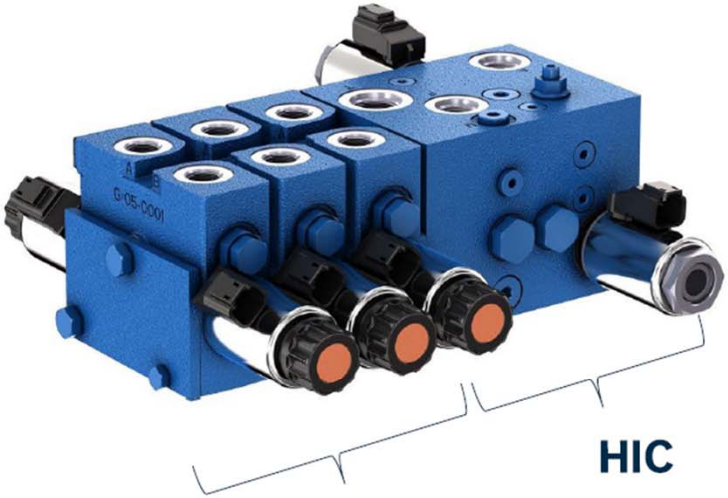


EDG



EDC

CPM - ED



HIC

EDG

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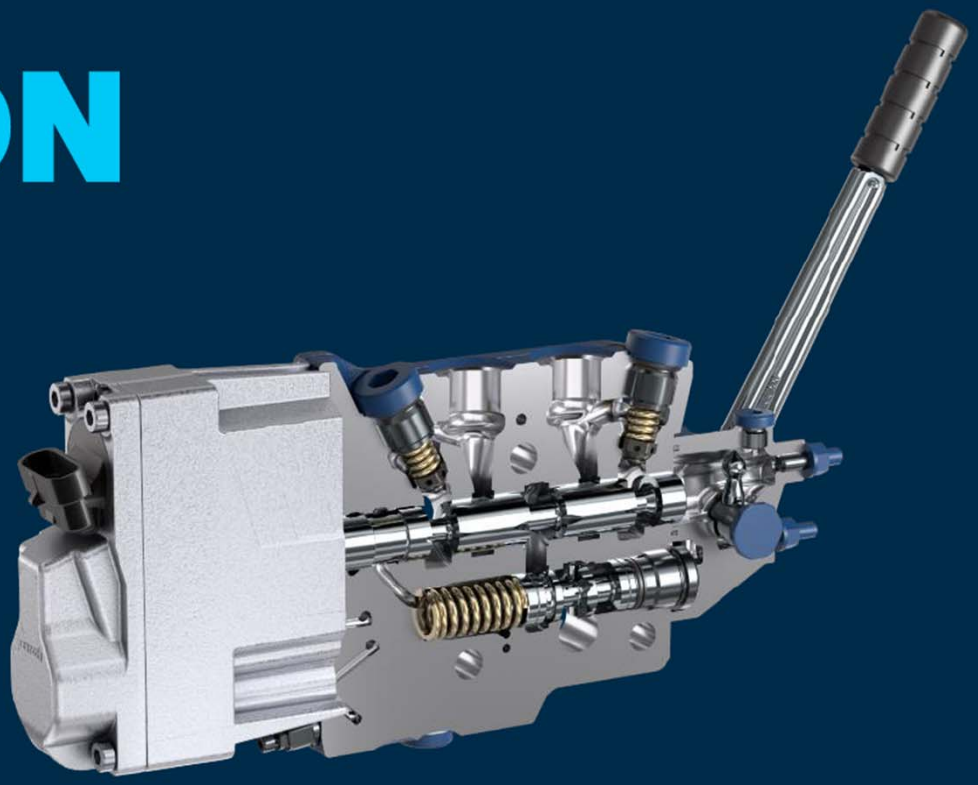
INTRODUCTION

RM Global is an advanced proportional valve with pressure compensator, designed for precise control and high efficiency



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RM Global | Benchmark

RM Global

Nominal pressure	420 bar
Max. flow	120 l/min 200 l/min

- More functionality
- Combinability
- More protocols
- More tools
- Carbon footprint
- Less Δp
- Higher p
- Less leakage
- Lockable lever
- Better resolution

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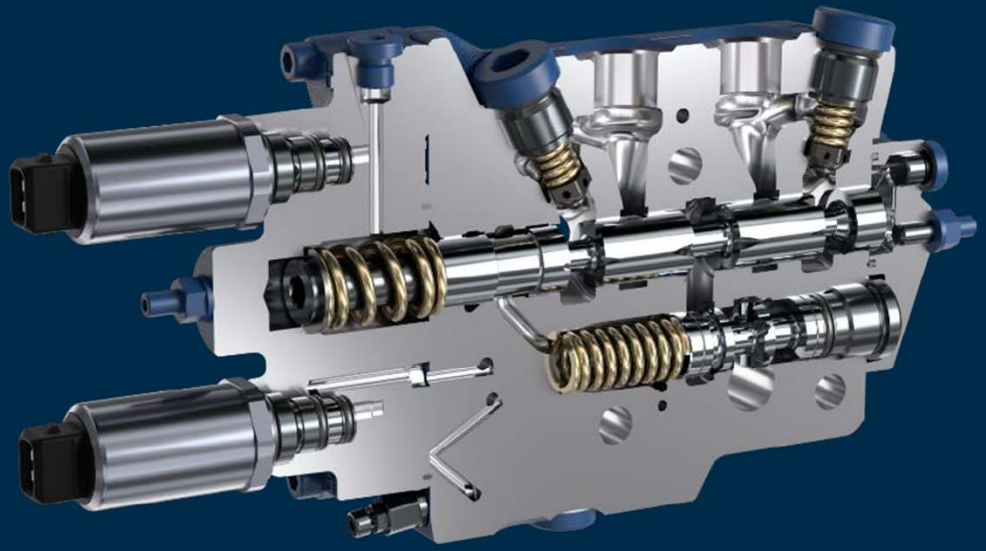
TECHNICAL VIEW

Experience enhanced product flexibility with RM Global



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Perfomance Enhancement – technical details

	RM10	RM15
Max. Pressure pump side [bar]	420	420
Max. Pressure consumer side [bar]	400	400
Max. Volume flow [l/min]	120	200
Max. sections per block	20	18
Width [mm]	42	47

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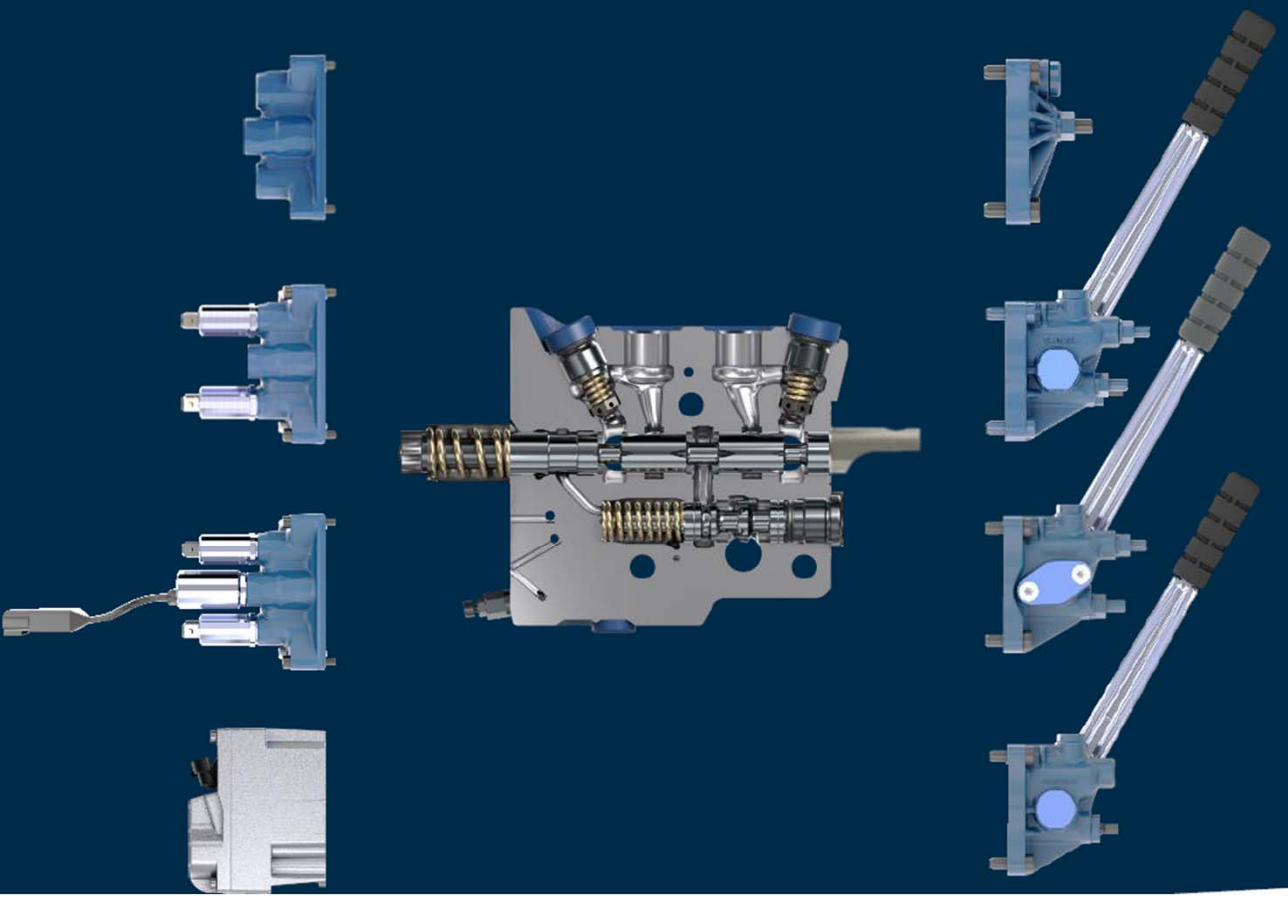
Actuation covers various requirements



- **A-side covers**
  - Hydraulic
  - Electro-Hydraulic
    (optional: spool position sensor)
  - Onboard-Electronic
- **B-side covers**
  - Standard
  - Following lever
  - Non-following lever
  - Lockable lever

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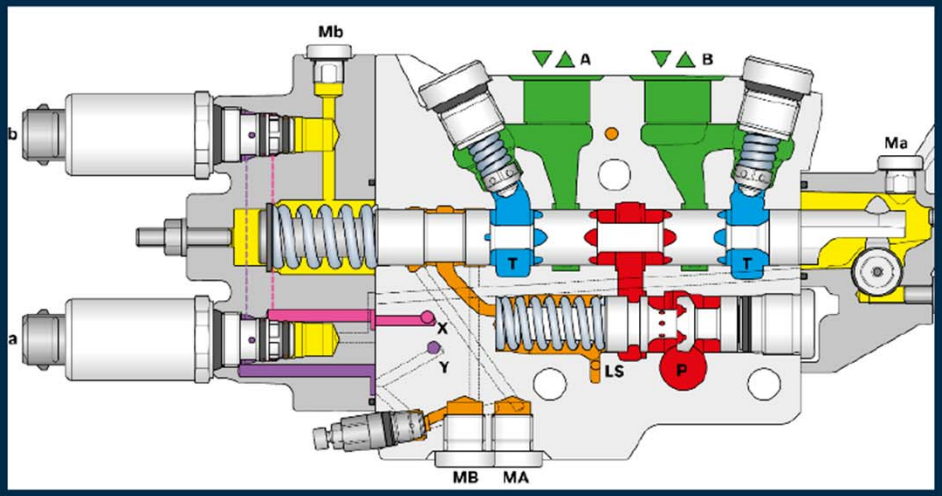
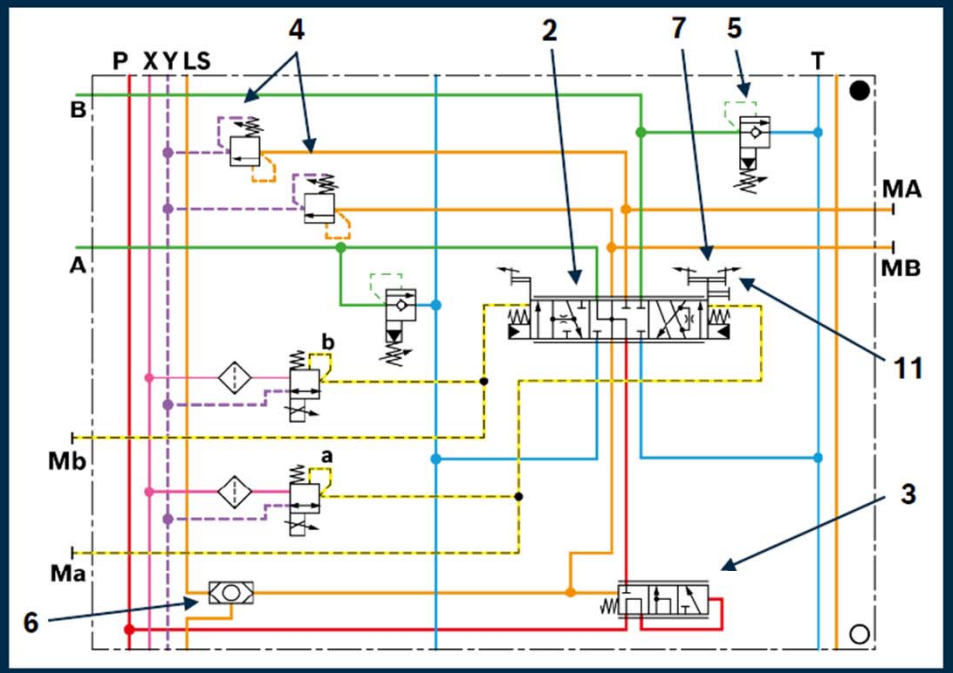
RM Global | TECHNICAL VIEW
Sectional image and fluid plan





Connections

P	Pump
A, B	Actuator
T	Tank
X	Piloting oil supply
Y	Tank, pressureless
LS	Load Sensing
M_A, M_B	Measuring ports

Components

2	Control spool
3	Pressure compensator
4	LS-RV
5	Shock-valve
6	LS shuttle valve
7	Spring chamber
11	Manual lever

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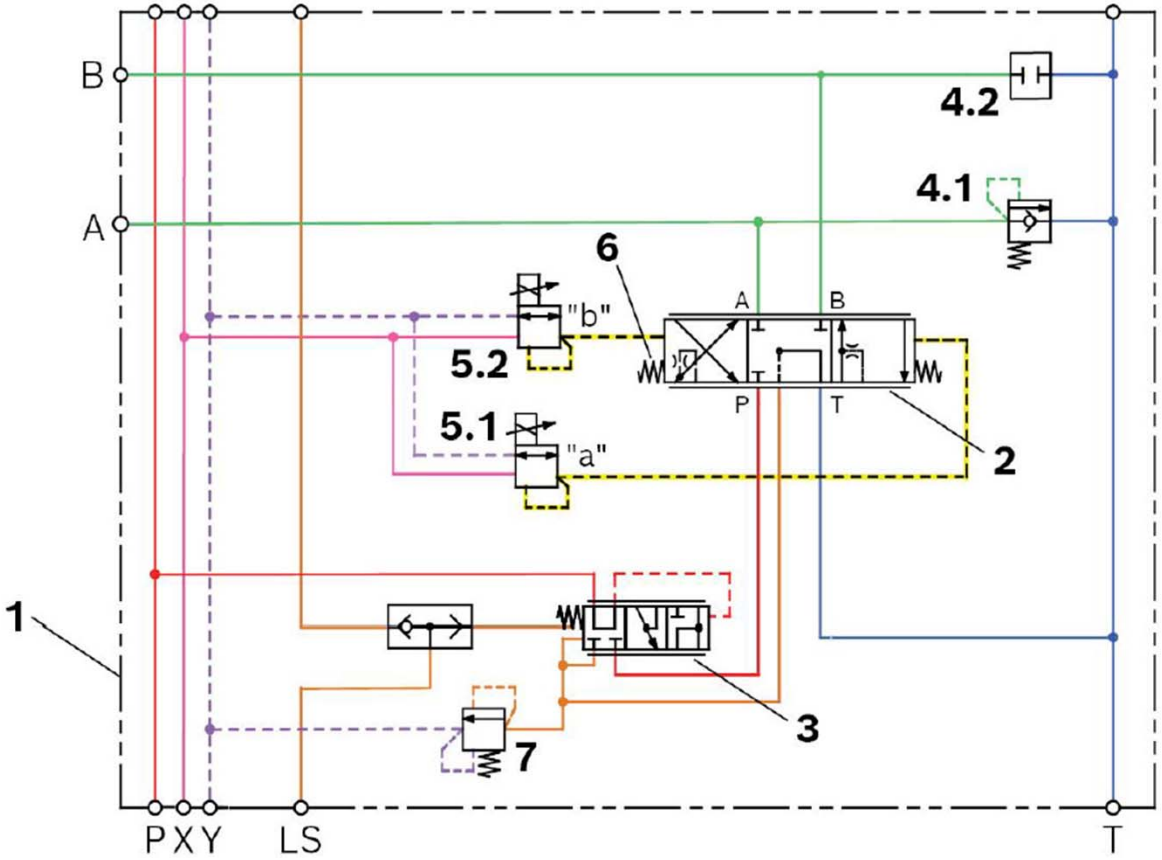
LS control blocks | RM valve series
Schematic



Connections	
P	Pump
A, B	Actuator
T	Tank
X	Piloting oil supply
Y	Tank, pressure less
LS	Load sensing
“a”, “b”	Pressure reducing valve

Components	
1	Housing [Body]
2	Control spool
3	Pressure compensator spool
4.1	Secondary relief valve, Port A
4.2	Threaded plug
5.1	Pressure reducing valve (pilot valve “a”)
5.2	Pressure reducing valve (pilot valve “b”)
6	Main spool, centering spring
7	A & B load sense relief valve

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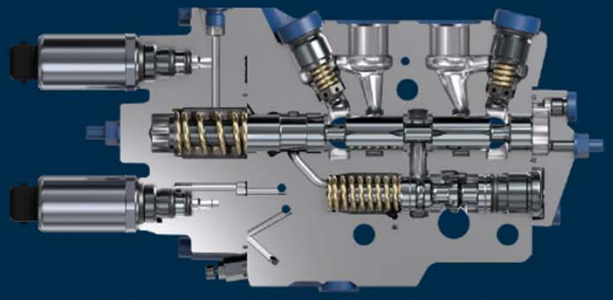
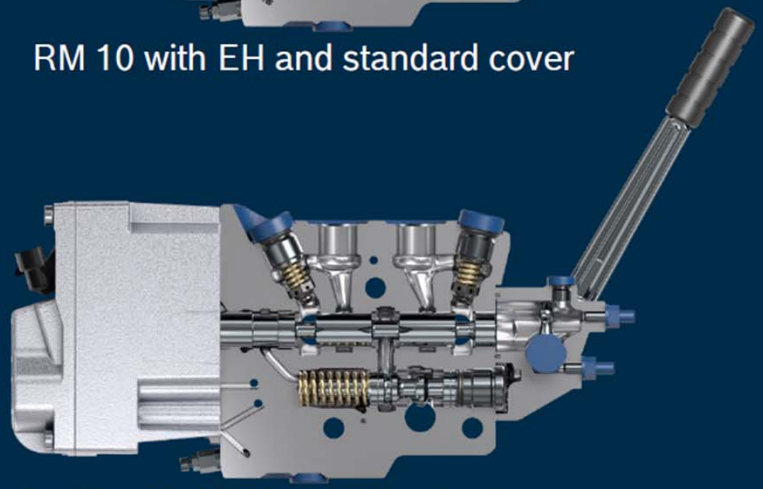
Actuation covers various requirements
Spool Commanding



RM 10 with EH and standard cover



RM 10 with OBE and following lever

General

- Resolution improvement based on larger spool stroke between M4-12 to RM10

Electro Hydraulics

- Operation coefficient between mA/mm improved by +9,6 %

Onboard Electronics

- 5 µm sensor resolution per side

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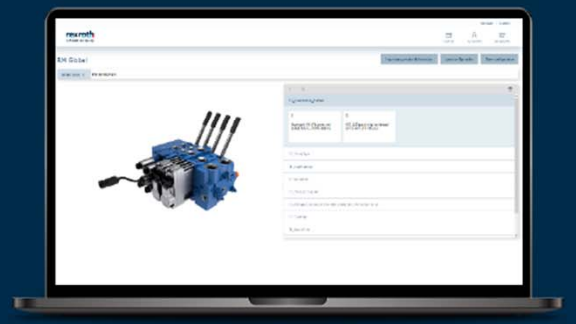
CONFIGURATOR

The RM Global configurator allows for the online customization of rifles and components.



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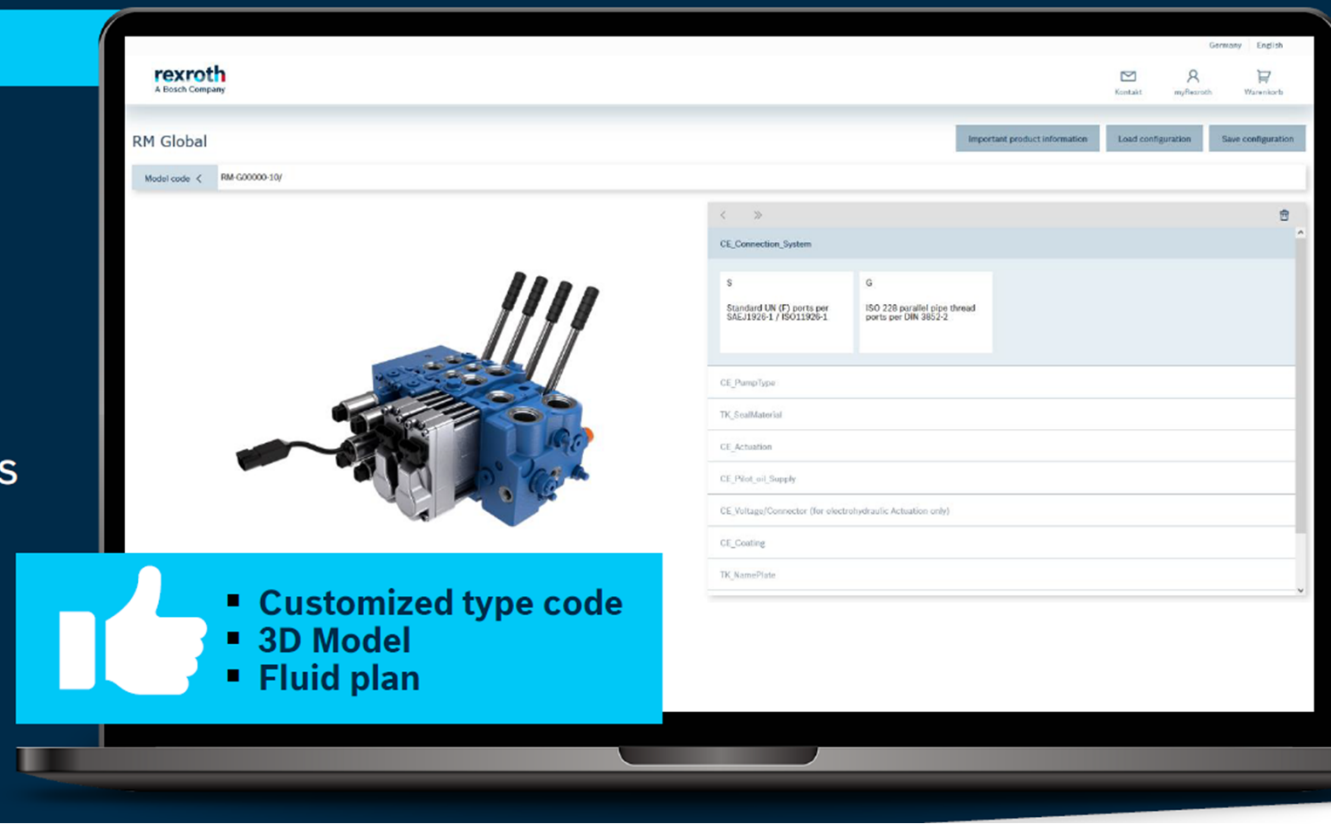
Mobile Control

ONLINE CONFIGURATION

in a few clicks

- Determination of customer needs
- Digital product recommendation
- Detailed insight into customer needs



- Customized type code
- 3D Model
- Fluid plan

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FUTURE ORIENTED

The new OBE module EHS4 2.0 is our solution for the future.

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Next topic:

- New project
- CHoose

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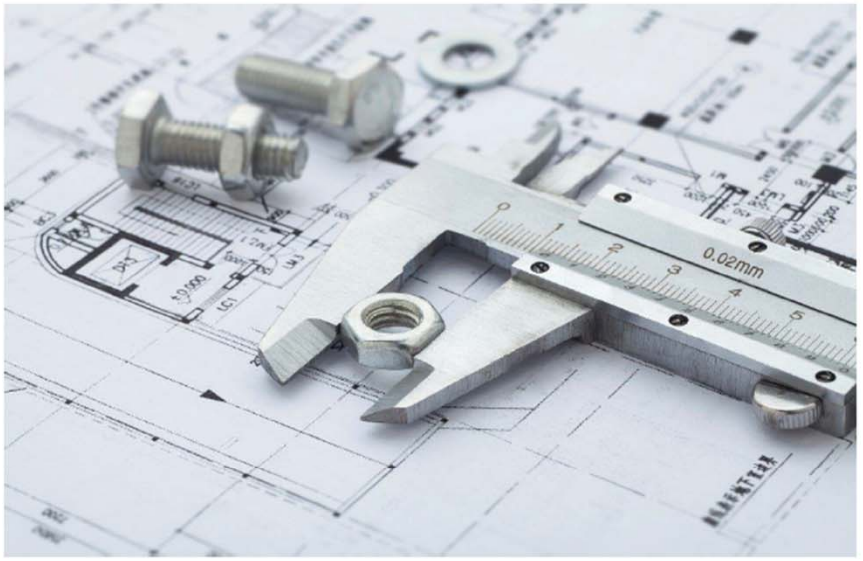
COMPACT DIRECTIONAL VALVE
Preliminary info for new project

- Annual demand + SOP
- Application & hydraulic function
- Flow rate
- Working pressure
- Hydraulic scheme
- Ports size
- Valves setting
- Coil voltage + connections
- Eventual accessories
- Target price
- ...



Quick design = higher chance to get the project!

The more information, the better it is.

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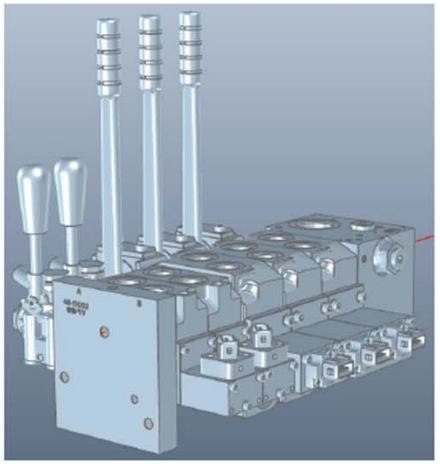
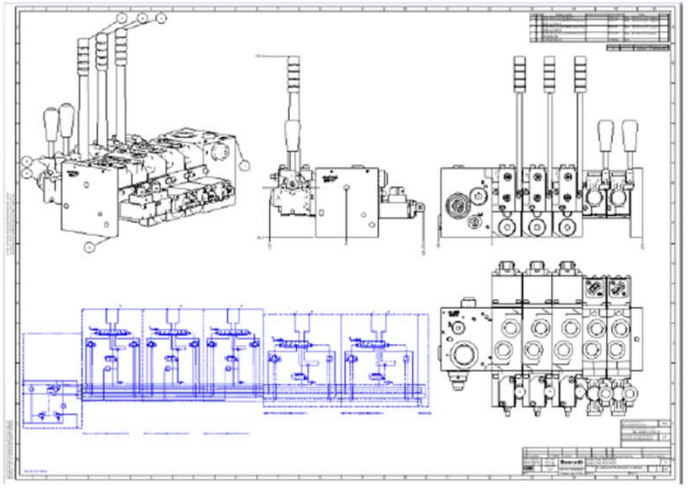
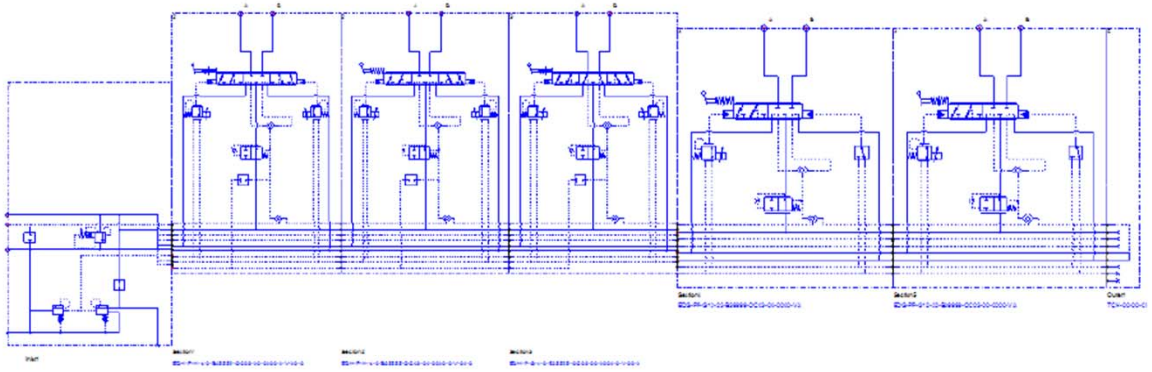
COMPACT DIRECTIONAL VALVE

CHoose project

Inlet	TEH 16 01 01 35 99 CI
	16: Closed center for vallable displacement pump
	01: With pressure reducing and relieving MHJDRDB, without external oil supply
	01: DIN ports and connections
	35: w/ primary pressure relief valve 100~420bar
	99: w/o LS relief valve
	CI: Material Cast Iron
Slice 1	EDH P H 4 0 B2 5555 OC07 00 0000 0 V 00 0
	H: Flange configuration H
	4: G port
	0: Local compensator bias spring
	B: P, A, B closed LS to T
	2: 4/3 operated both sides a and b
	5555: 80L/min
	OC: DC24V
	07: elwctricconnection DT04 4P
	00 0000: w/o secondary valve
	0: auellary ports on LSA an LSB, cavity dot drilled / No option
	V: Lever type manual override on A side · Vertical
	00: LS signal management No option
	0: Spool sensor no option
Slice 2	EDH P H 4 0 B2 5555 OC07 00 0000 0 V 00 0
Slice 3	EDH P G 4 0 E2 5555 OC07 00 0000 0 V 00 0
	G: Flange configuration G
	4: G port
	0: Local compensator bias spring
	E: P closed, A, B, LS to T
	2: 4/3 operated both sides a and b
	5555: 80L/min
	OC: DC24V
	07: elwctricconnection DT04 4P
	00 0000: w/o secondary valve
	0: auellary ports on LSA an LSB, cavity dot drilled / No option
	V: Lever type manual override on A side · Vertical
	00: LS signal management No option
	0: Spool sensor no option
Slice 4	EDG PP G12 22 B3 9999 OC07 00 0000 VA
	P: Electro - piloted
	P: Proportional configuration
	G12: G 1/2 DIN 3852
	2: Local compensator bias spring 8 bar
	2: With P TA TB LSYA YB X Y lines
	B: P, A, B closed and LS to T
	3: 4/2 operated side A
	9999: Flow rate over valve connection, 52L/min
	OC: DC24V
	07: with coils with connection DT04 4P
	00: Without secondary valve
	0000: without secondary valve
	VA: Lever type manual override on A side · Vertial
Slice 5	EDG PP G12 22 B3 9999 OC07 00 0000 VA
Outlet	TCH 00f 00 CI







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Looking forward to serving you!

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