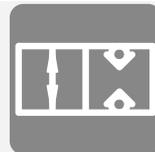


Valve bank (directional seated valve) type TLC 3

Product documentation



Operating pressure p_{\max} :

250 bar

Flow rate Q_{\max} :

3 lpm



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1 Overview of TLC 3 valve bank

The directional spool valve type TLC is a combined design consisting of a directional spool valve and a releasable check valve. It can be used to hold hydraulic actuators in position for long periods of time. The built-in T-throttles allow the user to pre-set the speed of the actuators. The magnetic plugs used are IP65 connectors (AMP superseal) used in the automotive industry.

Multiple directional valves can be combined in series in the valve bank type TLC. Combined with the compact hydraulic power pack type A10, this forms a mini-hydraulics system solution that requires little space and uses low flow rates up to 3 lpm.

Features and benefits

- Requires little space thanks to compact design
- IP 65 connector (AMP superseal)

Intended applications

- Operating tables
- Airline seats
- Automotive (window lifters)

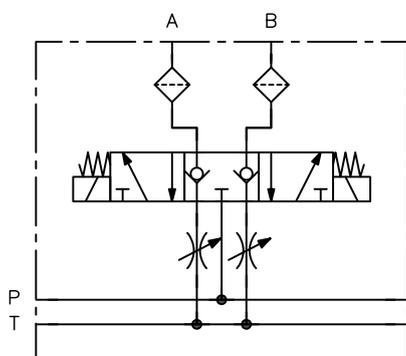


TLC 3 valve bank

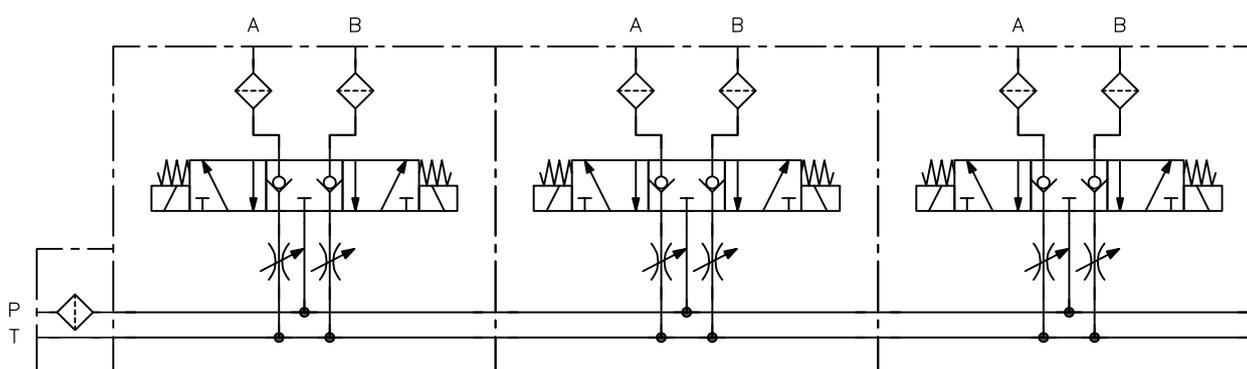
2 Available versions

Circuit symbol

Single block



Valve bank



Ordering example

TLC3	-A	8	MD
		2.4 "Solenoid voltage"	
		2.3 "Number of functions"	
		2.2 "Inlet block, connection block"	
		2.1 "Basic type and size"	

2.1 Basic type and size

Type	Description	Flow rate Q _{A/B} max (l/min)	Pressure p _{max} (bar)
TLC 3	with throttle and releasable check valves	3	250

2.2 Inlet block, connection block

Coding	Description
A	inlet plate
B	adapter plate (hydraulic power pack A with motor F2E, A4B and R2E)
C	adapter plate (hydraulic power pack A with motor A4D and B2D)

2.3 Number of functions

Coding	Description
1	1x double-acting
2	2x double-acting
3	3x double-acting
4	4x double-acting
5	5x double-acting
6	6x double-acting
7	7x double-acting
8	8x double-acting

2.4 Solenoid voltage

Coding	Description
ME	12 V, AMP Superseal
MD	24 V, AMP Superseal

3 Parameters

3.1 General data

Designation	valve bank type TLC 3
Design	spool valve with releasable check valves
Model	A: inlet plate B: adapter plate (hydraulic power pack A with motor F2E, A4B and R2E) C: adapter plate (hydraulic power pack A with motor A4D and B2D)
Installation position	any
Material	steel
Materials for seals	NBR
Attachment	depending on design see Chapter 4.1
Ports/connections	hydraulic: M10x1
Pilot ratio	for the piloted check valve approx. 7 : 1
Hydraulic fluid	Viscosity range: 10 - 300 mm ² /s
Cleanliness level	ISO 4406 <u>20/18/15</u>
Filter retention rate β	25 to 75
Temperatures	Environment: approx. -30 to +80 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range.

3.2 Weight

TLC 3 -A/B/C -1	1.06 kg
TLC 3 -A/B/C -2	1.72 kg
TLC 3 -A/B/C -3	2.38 kg
TLC 3 -A/B/C -4	3.04 kg
TLC 3 -A/B/C -5	3.70 kg
TLC 3 -A/B/C -6	4.36 kg
TLC 3 -A/B/C -7	5.02 kg
TLC 3 -A/B/C -8	5.68 kg

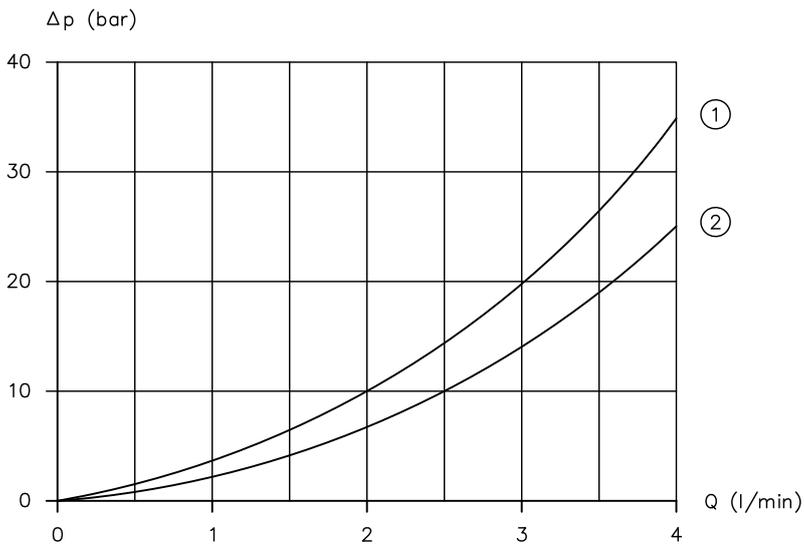
3.3 Pressure and volumetric flow

Max. operating pressure 250 bar

Max. flow rate 3 l/min

3.4 Characteristic lines

Pressure drop curve



Q flow rate (lpm); Δp pressure (bar)

- 1 A/B → T (throttle open)
- 2 P → A/B

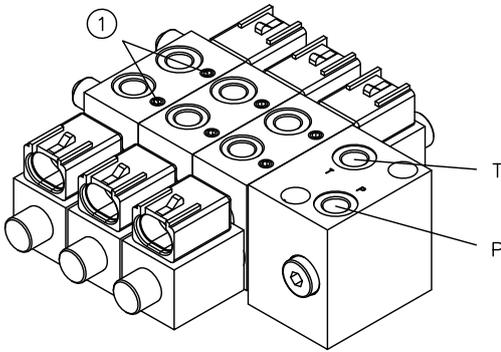
3.5 Electrical data

Nominal voltage	12 V DC	24 V DC
Nominal power	16 W	10 W
Nominal current	1.33 A	0.42 A
Switching voltage (at $T < +40\text{ °C}$ and $Q < 1\text{ l/min}$)	min. 10 V	min. 19 V
Resistance R20	$9\ \Omega \pm 10\%$	$66\ \Omega \pm 10\%$
Varistor (in plug housing)	S07K30	S07K50
Relative duty cycle	depending on environment, up to 100% duty cycle	
Excitation winding	insulation class H	
Solenoid connection	AMP Superseal 1,5 plug, line cross section 0,3 - 1,5 mm ²	
Coil body material	PA 6.6	

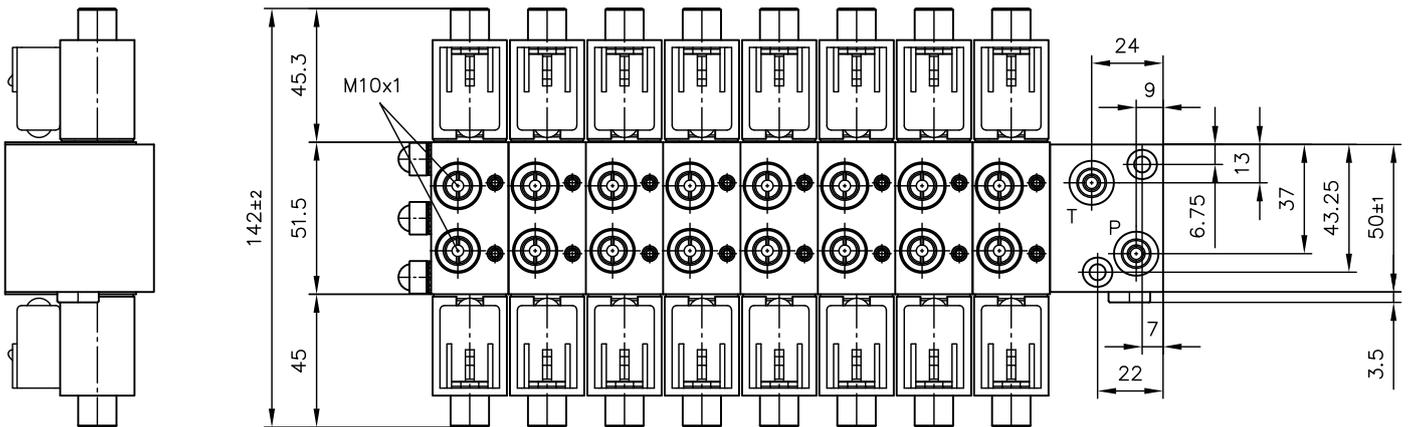
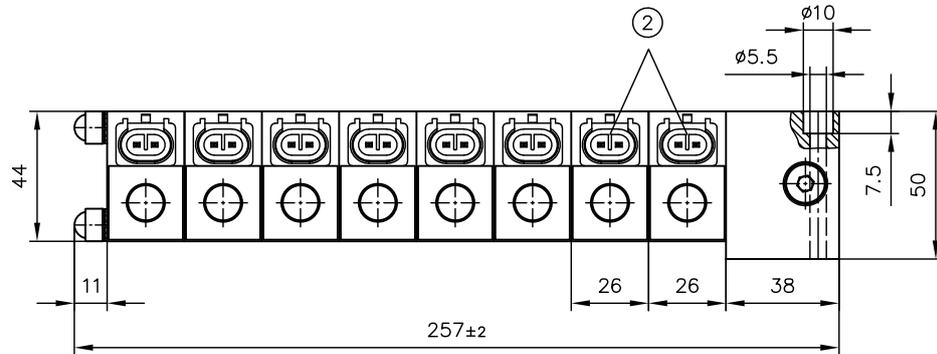
4 Dimensions

All dimensions in mm, subject to change.

Connection plate A



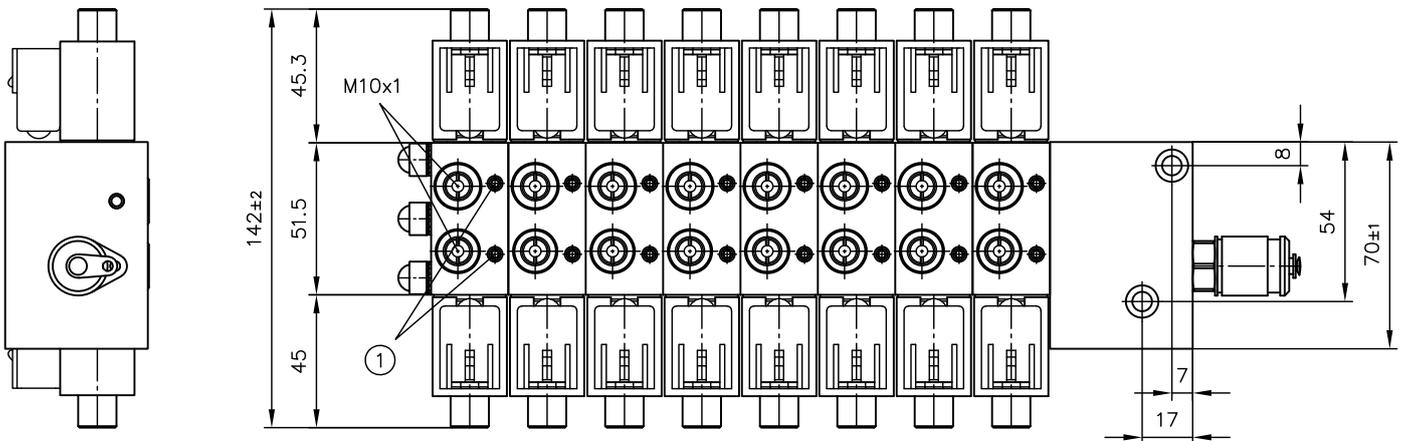
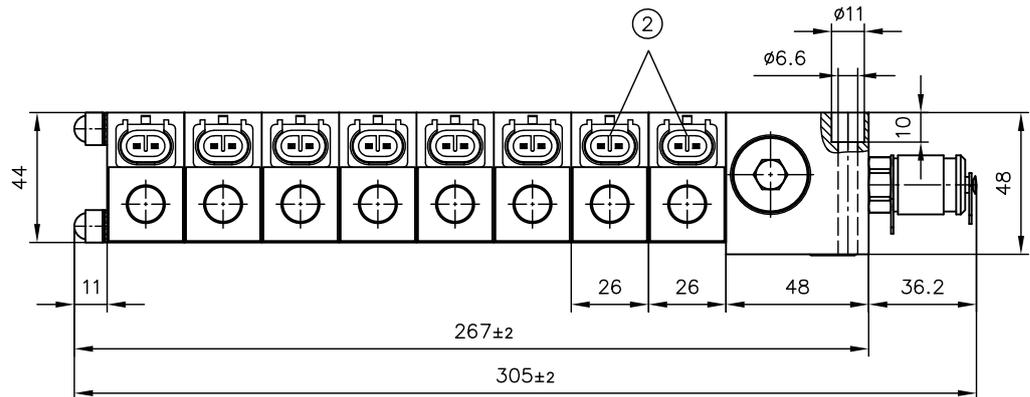
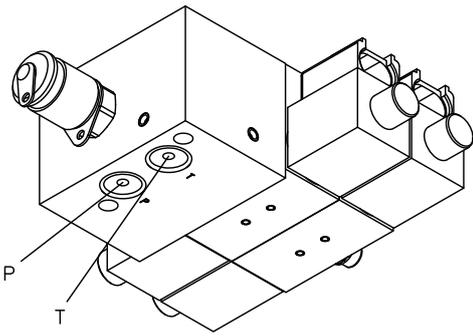
1 Adjusting screw for return throttle (T-throttle)



Connection plate A: Hose connections (TLC 3-A)

2 Electrical connection

Connection plate C: Narrow equipment racks



Connection plate C: Narrow equipment racks (TLC 3-C)

- 1 Adjusting screw for return throttle (T-throttle)
- 2 Electrical connection

5 Installation, operation and maintenance information

Observe the document B 5488 "General operating instructions for assembly, commissioning, and maintenance."

5.1 Intended use

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

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

Essential requirements for the product to function correctly and safely:

- ▶ All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- ▶ The product must only be assembled and put into operation by specialist personnel.
- ▶ The product must only be operated within the specified technical parameters described in detail in this document.
- ▶ All components must be suitable for the operating conditions when using an assembly.
- ▶ The operating instructions for 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 (in particular in combination with hydraulic accumulators).



DANGER

Sudden movement of the hydraulic drives when disassembled incorrectly

Risk of serious injury or death

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



DAMAGE

Property damage from incorrectly installed hydraulic system

- ▶ Assembly by trained specialists only.
- ▶ Ensure all labels and markings of the hydraulic system are easily visible and legible after assembly.
- ▶ Check installation space/connection points for damage.



DAMAGE

Damage from connecting soiled components

Connecting soiled components may cause system failure and irreparable damage.

- ▶ Clean the workspace before connecting the hydraulic system.
- ▶ Clean hydraulic components before connecting the hydraulic system.
- ▶ Only use hydraulic fluid of sufficient grade.

Electrical and hydraulic connection**! DAMAGE****Only use suitable fittings**

1. Space required for assembly, installation and commissioning: 500 x 100 x 250 mm (WxHxD).
2. Place the product in position in the higher-level machine.
3. Ensure that all the fastening bores and hydraulic connections align correctly.
4. Tighten the hydraulic connections and fastening screws of the valve bank correctly.
5. Connect the electromagnetic valves to the control system:

i NOTE**It is not permitted to actuate more than one solenoid per valve unit at the same time (function of the TLC 3).**

- ▶ AMP Superseal 1.5 plug, conductor cross-section 0.3 - 1.5 mm².
 - ▶ Use the cable with the matching plug in accordance with the technical data sheet.
 - ▶ Ensure that you are using the right power supply: 12 V DC (16 W), 24 V DC (10 W).
 - ▶ Push the cable plug into the coil bushing.
 - ▶ Then, connect the cable to the electrical power supply.
6. Turn the return throttle's adjusting screws all the way inwards, clockwise, using the hex key with 2.5 width across flats.
 - ▶ Note the end stop when turning them inwards.
 - ▶ Do not turn the adjusting screw out further than flush with the valve body.
 7. Apply the desired operating pressure to the product (TLC 3).
 - ▶ Note the operating pressure of the higher-level machine/unit.
 - ▶ If external leakage occurs, reduce the operating pressure and re-tighten the fittings.
 8. Test the fittings and electrical connection after a week of operating time.

Start-up

- Start-up may only be carried out by trained specialist personnel.
- The unit is secured against unintended activation.

1. Check that the hydraulic power pack is connected correctly:
 - ✓ mechanically/hydraulically
 - ✓ electrically: power supply, control
 - ✓ fixed installation: attachment to the machine, in/on the base
2. Configure the flow rate on the return throttles one after another:
 - a) Energize the solenoid of one valve unit
 - b) Turn on the motor of the attached unit (e.g. hydraulic power pack).
 - c) Open the adjusting screw counter clockwise, until the desired flow rate is achieved (as a maximum so it is flush with the valve body).
 - d) Repeat steps 2a and 2c until all flow rates are configured on the return throttles.
 - e) Then, check and readjust the configured flow rates.
 - f) Secure the adjusting screws against unauthorised tampering using a threadlocker.

⚠ CAUTION**Unwanted or sudden opening of the add-on valves (= TLC3 valve unit) due to careless configuration of the flow rate.**

If not all of the return throttles are configured and opened, then counter-pressure can build up upstream of the releasable check valves, causing the check valve to open. Flow rate and pressure cannot be kept stable (fluctuating operating state).

- ▶ Configure all the return throttles during commissioning.
- ▶ Secure the adjusting screws with the threadlocker after configuration.

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