

REHOBOT®

MADE IN SWEDEN

POWER WITH HYDRAULICS

INSTRUCTIONS ON MOUNTING HOSES & ACCESSORIES

Version 1.1



256 TON

HAND PUMPS, ELECTRICAL PUMPS, AIR
AND PETROL DRIVEN PUMPS, CYLINDERS,
HOLLOW CYLINDERS, COMPACT CYLINDERS,
HYDRAULIC TOOLS AND ACCESSORIES.

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Table of contents

Composing a hydraulic system with PHS, 70 MPa

External safety valve for regulating pressure VR30	3
External safety valve for regulating pressure VR31	4
External safety valve for regulating pressure VR150	5
Double-acting cylinders on PHS with VR42	6
Lifting four points with the same weight	7
Control two cylinders at the same time	8
Control three cylinders at the same time	9
Control four cylinders at the same time	10
Connect four cylinders with ball-valve VA80	11
Shut-off valve with built in check valve VAB114	12
Shut-off valve VA14 with built-in hose rupture QC	13

Composing an ultra high pressure system with PHS

Accessories for PHS150-series.....	14
PHS200-, PHS240-	15
PHS280-	16
PHS280- Alternative assembly.....	17

Composing a hydraulic system with PP, 70-150 MPa

Attach gauge onto PP70-1000-series	18
Control two cylinders at the same time	19
Accessories for PP150-1000.....	20

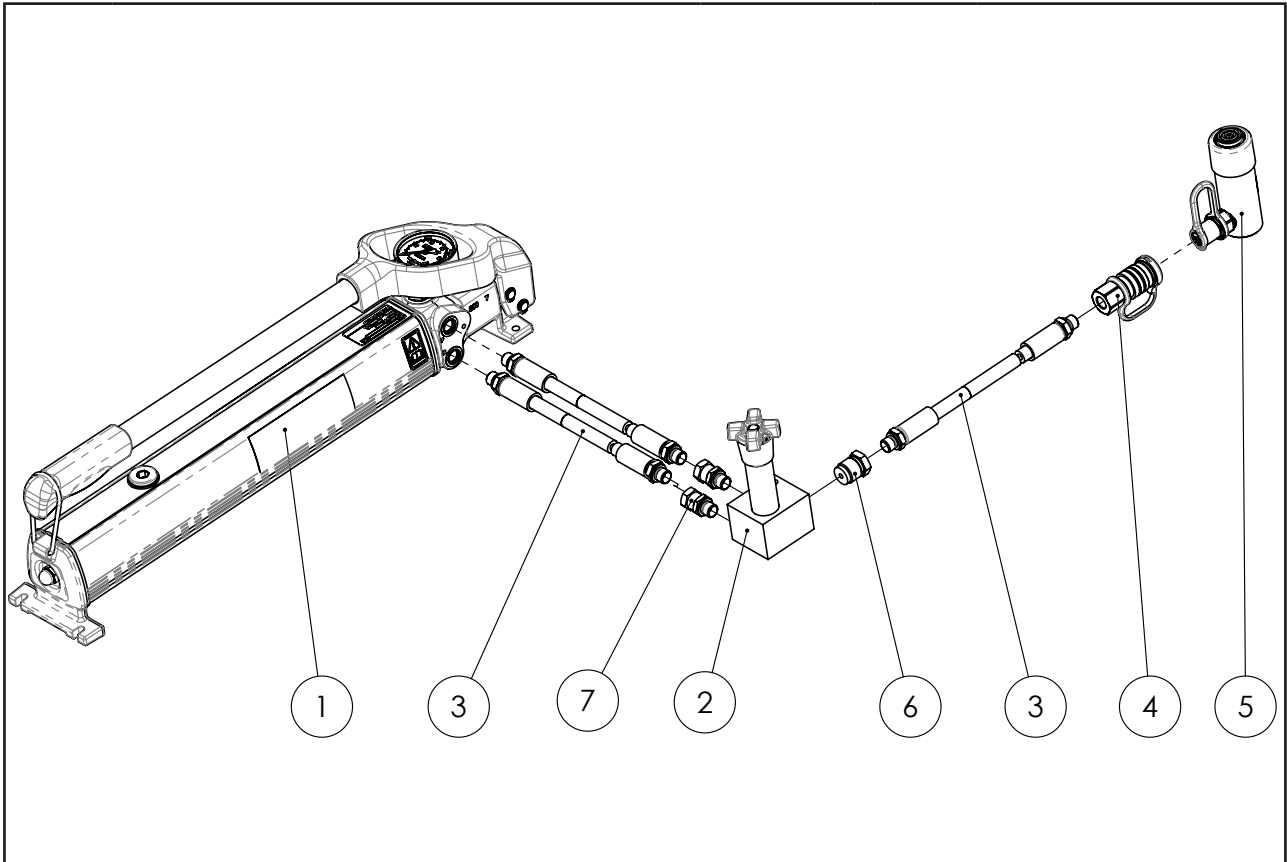
Composing a hydraulic system with PPxx-2500

Control two cylinders at the same time	21
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Important information

Different sealing methods	22
Oil types and viscosity in REHOBOT pumps.....	24
Parallel / synchronous lifting applications.....	25

External safety valve for regulating pressure VR30



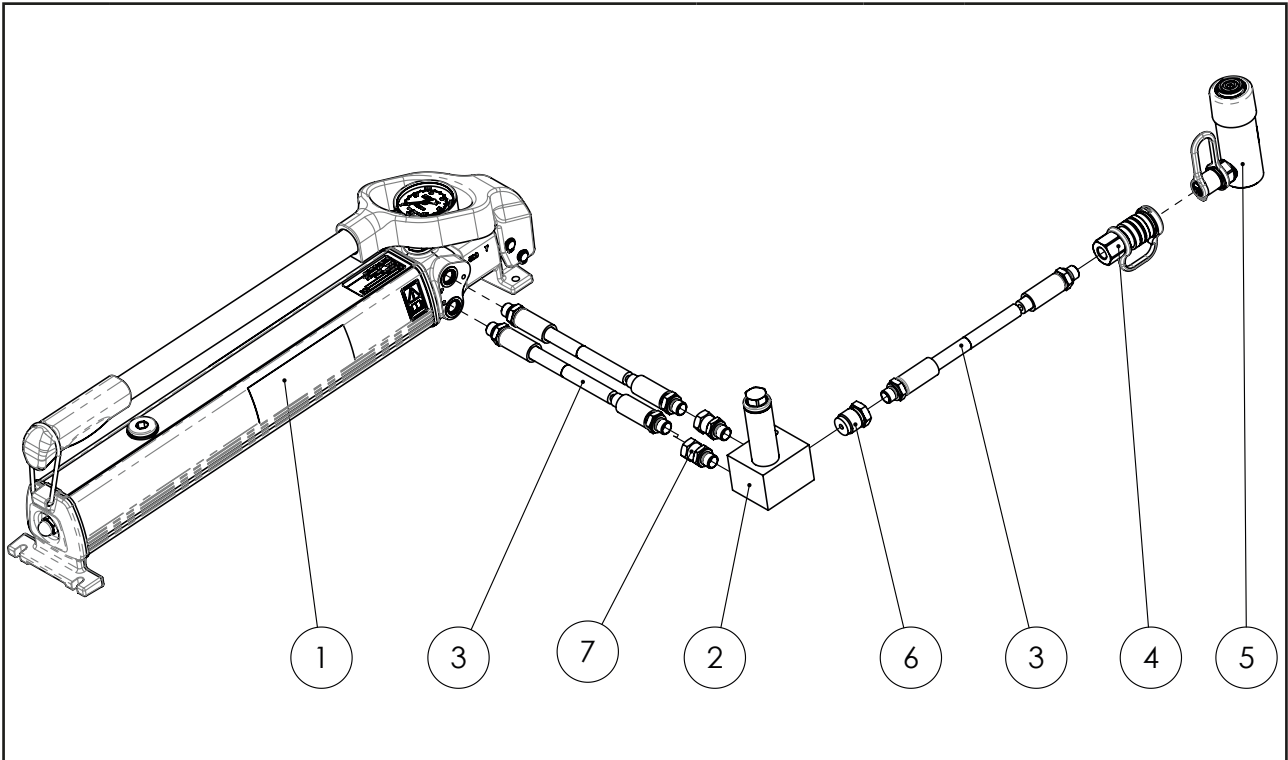
No.	Description	Part. no	Qty	More information
1	PHS70-series		1	
2	VR30	26910	1	
3	Hose (LSxxxES)		3	
4	AQI7 (Female quick coupling)*	46014	1	
5	Single acting cylinder		1	
6	Nipple AAE487	19445	1	Torque 100Nm
7	Nipple AAE505	37721	2	

Extra information:

- If you need to regulate the output pressure frequently.
- Pressure can be adjusted between: 0-70 MPa.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

External safety valve for regulating pressure VR31



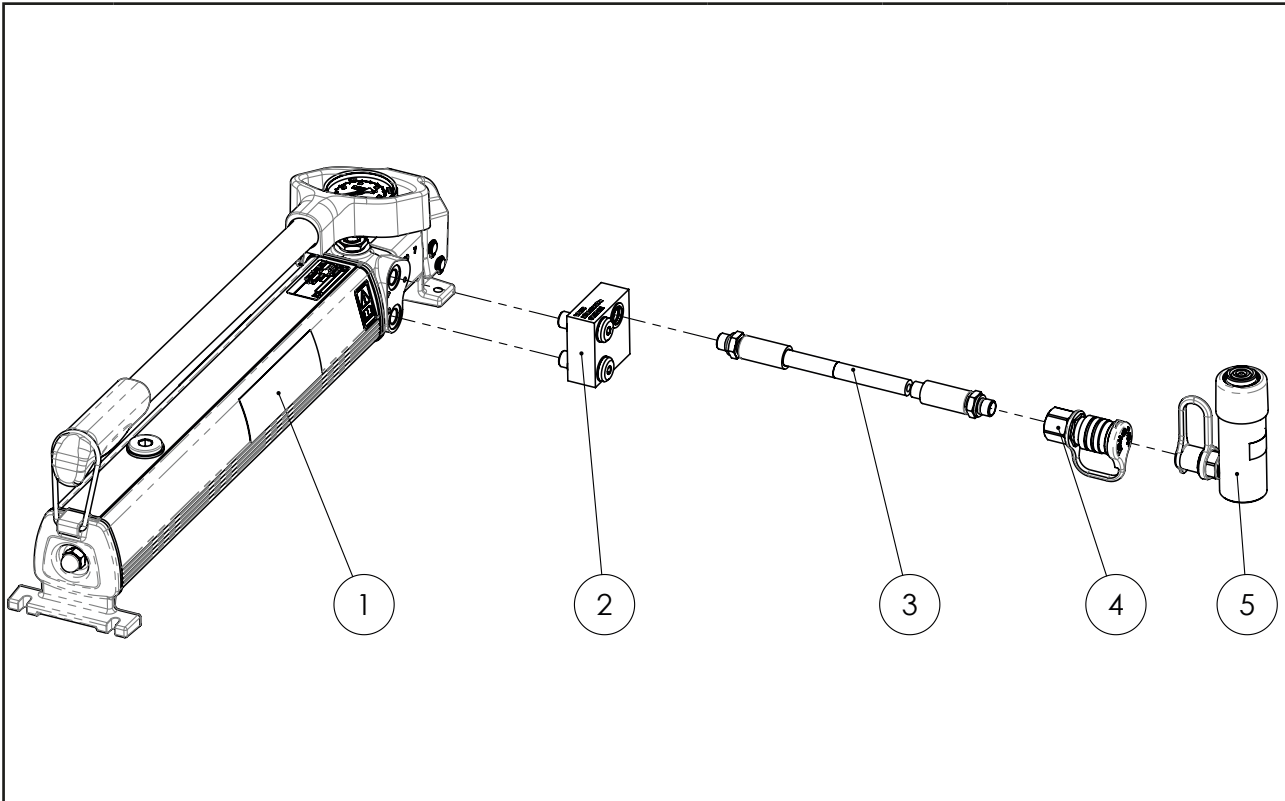
No.	Description	Part.no	Qty	More information
1	PHS70-series		1	
2	VRF31	26911	1	
3	Hose (LSxxxES)		3	
4	AQI7 (Female quick coupling)*	46014	1	
5	Single acting cylinder		1	
6	Nipple AAE487	19445	1	Torque 100 Nm
7	Nipple AAE505	37721	2	

Extra information:

- If you need to regulate the pressure and keep it unchanged.
- Pressure can be adjusted between: 0-70 MPa.
- Preset at 70 MPa.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

External safety valve for regulating pressure VR150



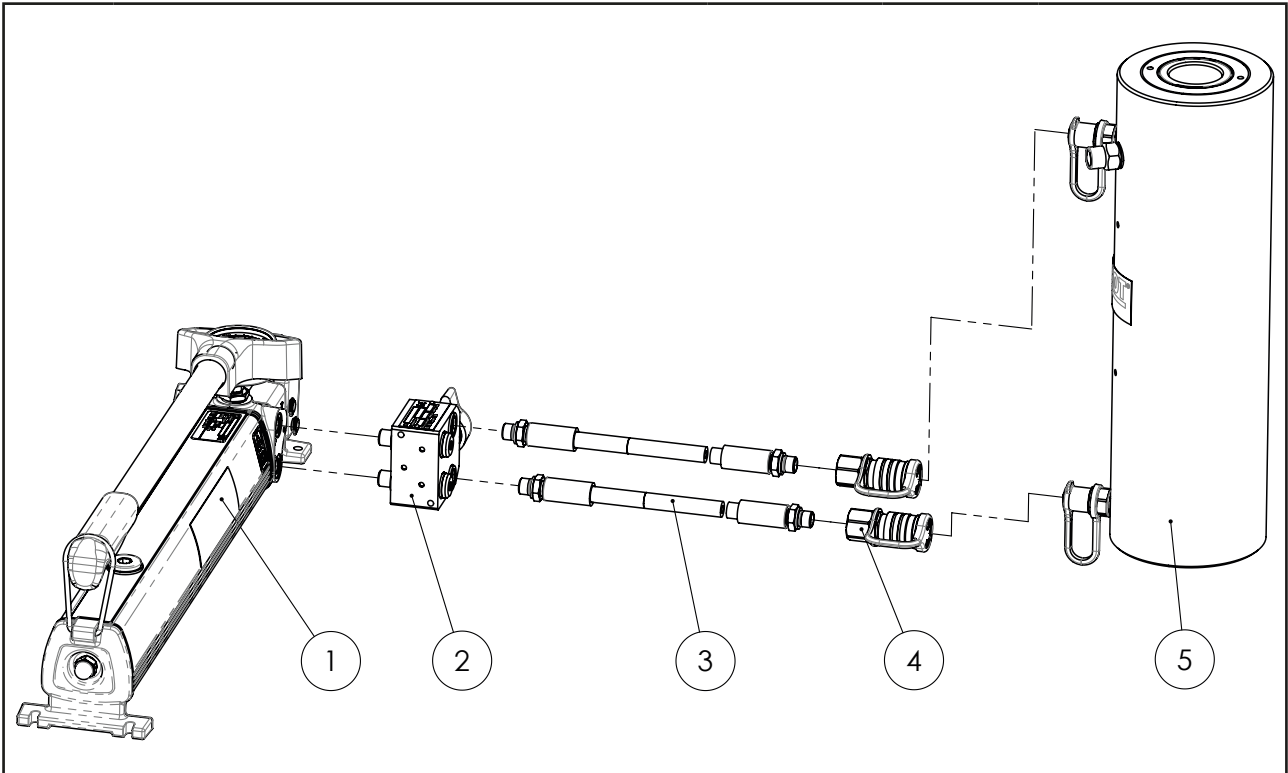
No.	Description	Part.no	Qty	More information
1	PHS70-series		1	
2	VR150	50460	1	DD46405
3	Hose (LSxxxES)		1	
4	AQI7 (Female quick coupling)*	46014	1	
5	Single acting cylinder		1	

Extra information:

- If you need to regulate the pressure and keep it unchanged.
- Pressure can be adjusted between: 50-150 MPa.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Double-acting cylinders on PHS with VR42



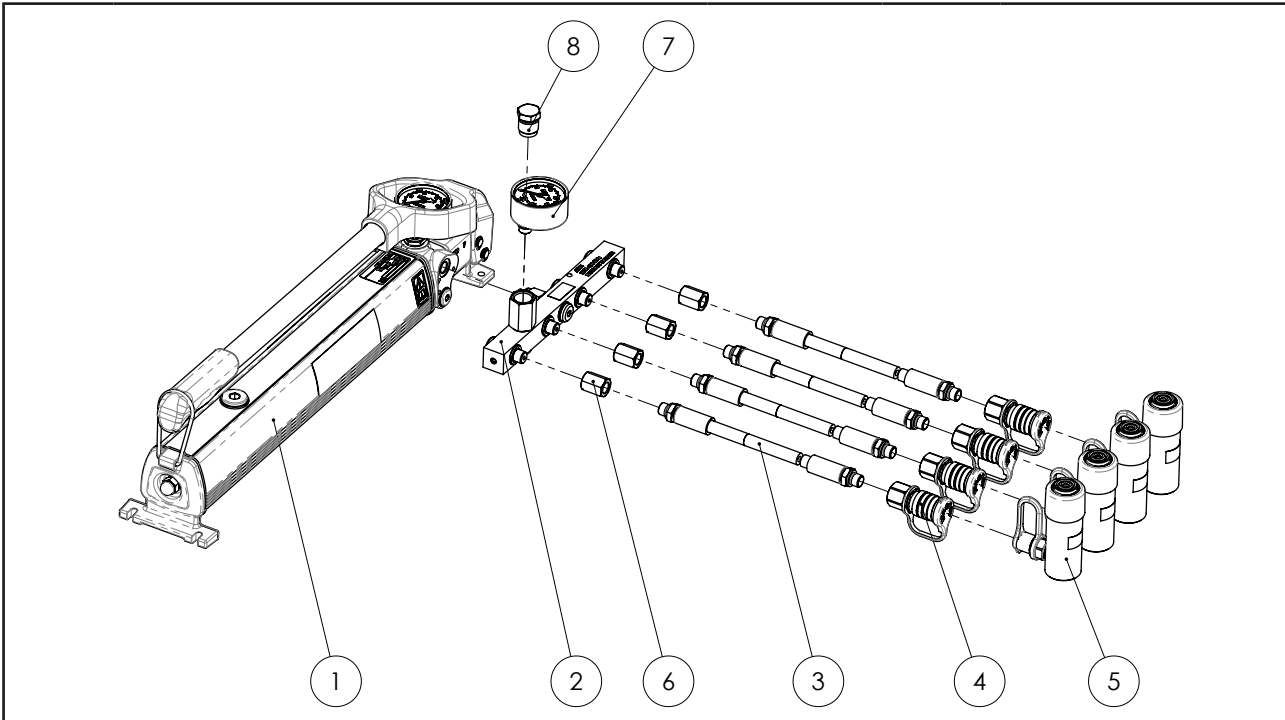
No.	Description	Part.no	Qty	More informa-tion
1	PHS70-series		1	
2	VR42	44500	1	DD45158
3	Hose (LSxxxES)		2	
4	AQI7 (Female quick coupling)*	46014	2	
5	Double acting cylinder		1	

Extra information:

- Adapt hand pump for double acting cylinders.
- Valve fits directly upon hand pump.
- VR42 easily be removed in order to use the hand pump in other applications.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Lifting four points with the same weight



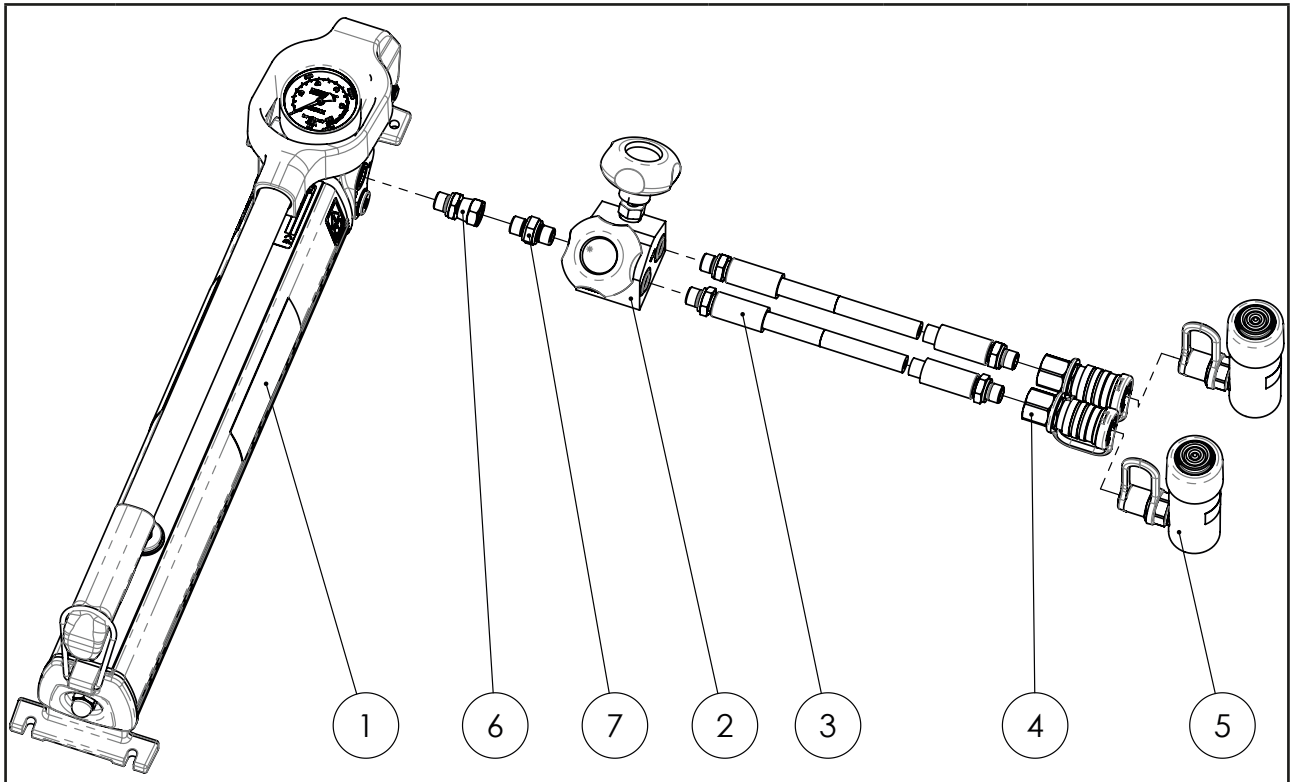
No.	Description	Part.no	Qty	More information
1	PHS70-series		1	
2	ATU4	46785	1	
3	Hose (LSxxxES)		4	
4	AQI7 (Female quick coupling)*	46014	4	
5	Single acting cylinder		4	
6	Nipple AAI456	19905	4	
7	AMP650, AMP651, AMP652		1	
8	Plug 700 bar	8539		no gauge

Extra information:

- If no gauge will be used, seal with plug #8.
- Oil container larger than 1 liter on PHS pump require 3x extra nipple: AAE502 and 2x washer 17009.
- Hose (LSxxxES) and nipple AAE502 between PHS pump and ATU4, due to askew center of gravity.
- For gauge on each port, add TX111 (TX102 gauge) or ATM214 (AMT801, TX104 gauge).
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Control two cylinders at the same time



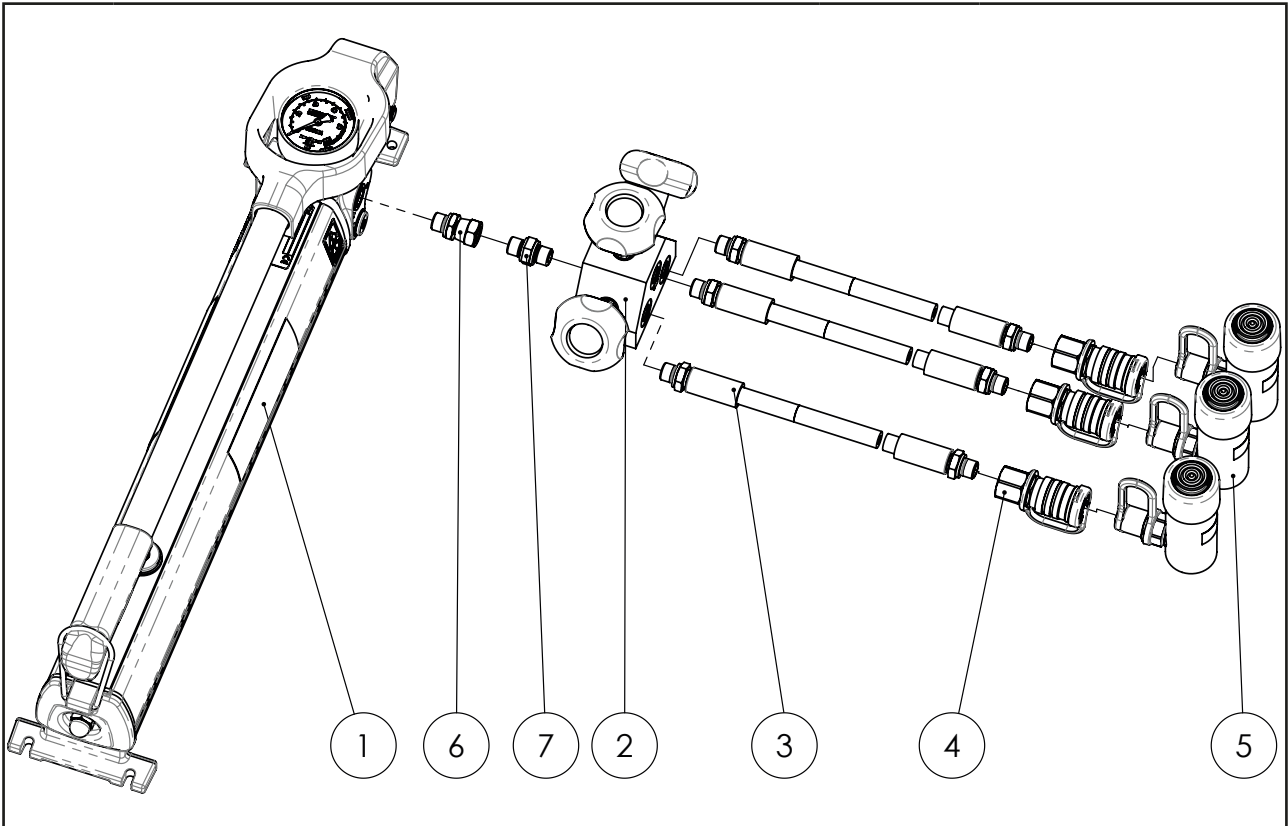
No.	Description	Part.no	Qty	More information
1	PHS70-series		1	
2	VAD2	19092	1	
3	Hose (LSxxxES)		2	
4	AQI7 (Female quick coupling)*	46014	2	
5	Single acting cylinder		2	
6	Nipple AAE505	37721	1	
7	Nipple AAU406	47469	1	

Extra information:

- Sviweling connection for VAD2, decide yourself how you want the shut-off handles.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Control three cylinders at the same time



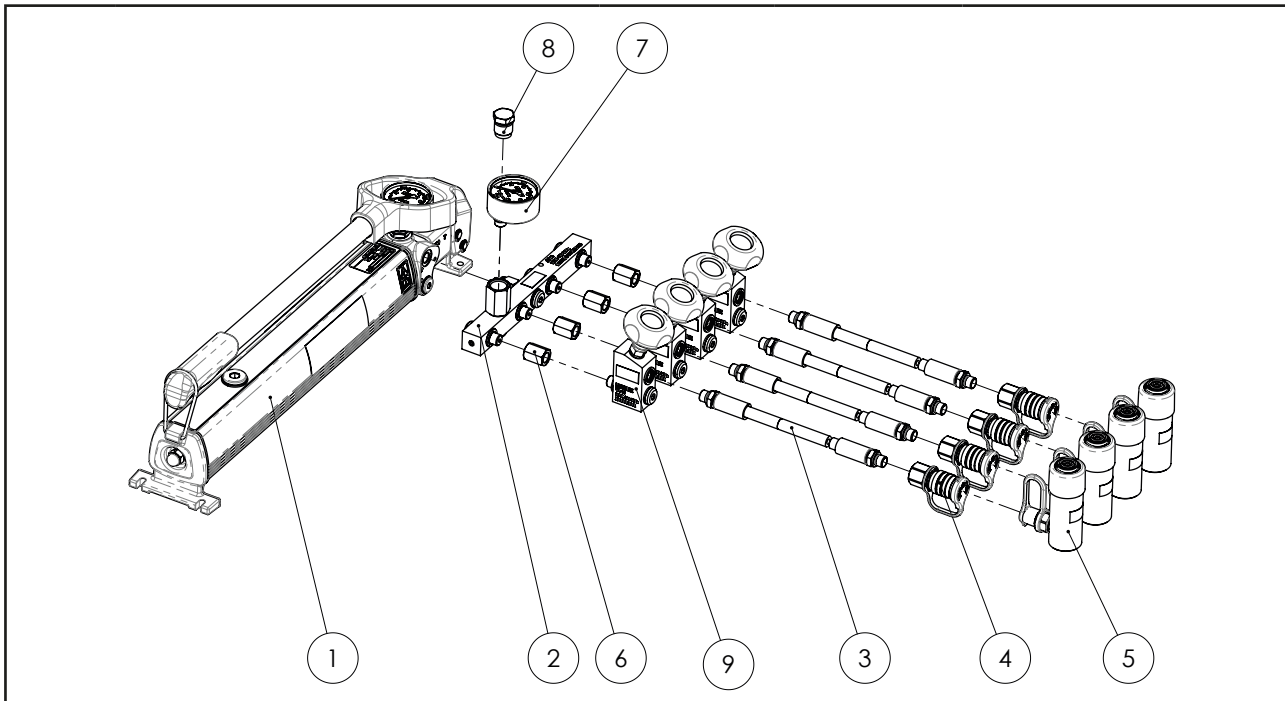
No.	Description	Part.no	Qty	More information
1	PHS70-series		1	
2	VAT3	19094	1	
3	Hose (LSxxxES)		3	
4	AQI7 (Female quick coupling)*	46014	3	
5	Single acting cylinder		3	
6	Nipple AAE505	37721	1	
7	Nipple AAU406	47469	1	

Extra information:

- Swiveling connection for VAT3, decide yourself how you want the shut-off handles.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Control four cylinders at the same time



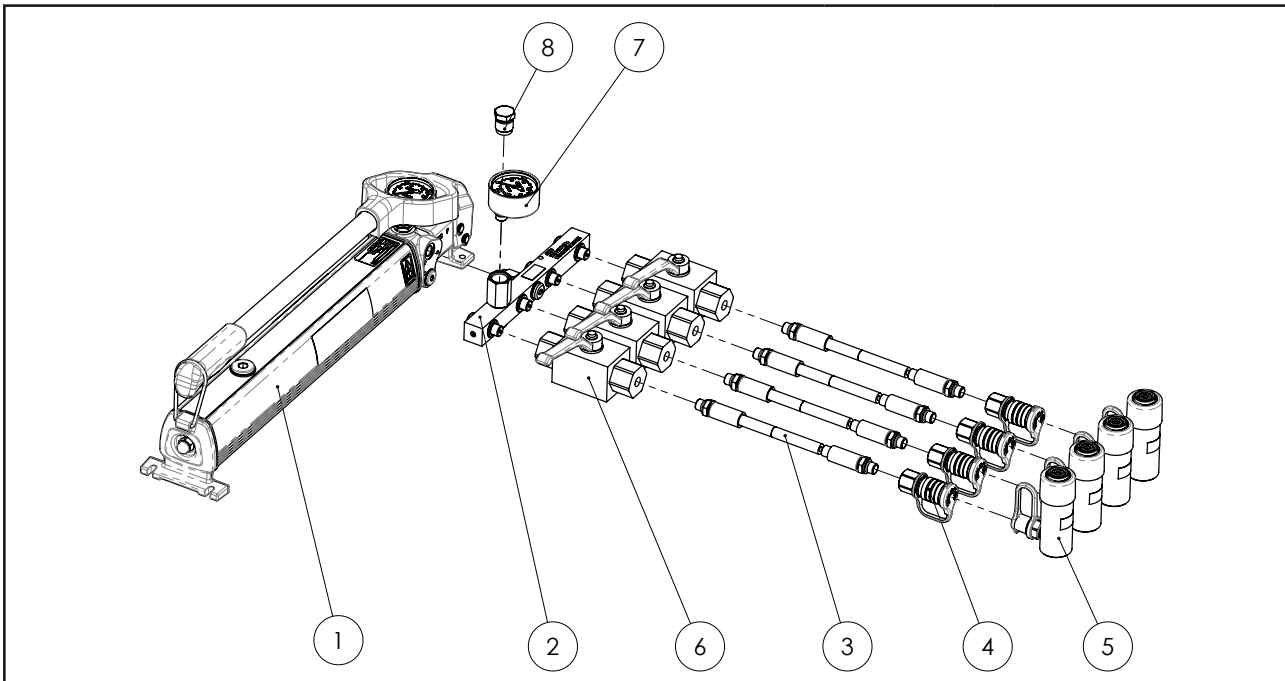
No.	Description	Part.no	Qty	More information
1	PHS70-series		1	
2	ATU4	46785	1	
3	Hose (LSxxxES)		4	
4	AQI7 (Female quick coupling)*	46014	4	
5	Single acting cylinder		4	
6	Nipple AAI456	19905	4	
7	AMP650, AMP651, AMP652		1	
8	Plug 700 bar	8539		No gauge
9	VA14	27072	4	

Extra information:

- If no gauge will be used, seal with plug #8.
- Oil container larger than 1 liter on PHS pump require 3x extra nipple: AAE502 and 2x washer 17009.
- Hose between PHS pump and ATU4, due to askew center of gravity.
- For gauge on each port, add TX111 (TX102 gauge) or ATM214 (AMT801, TX104 gauge).
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Connect four cylinders with ball-valve VA80



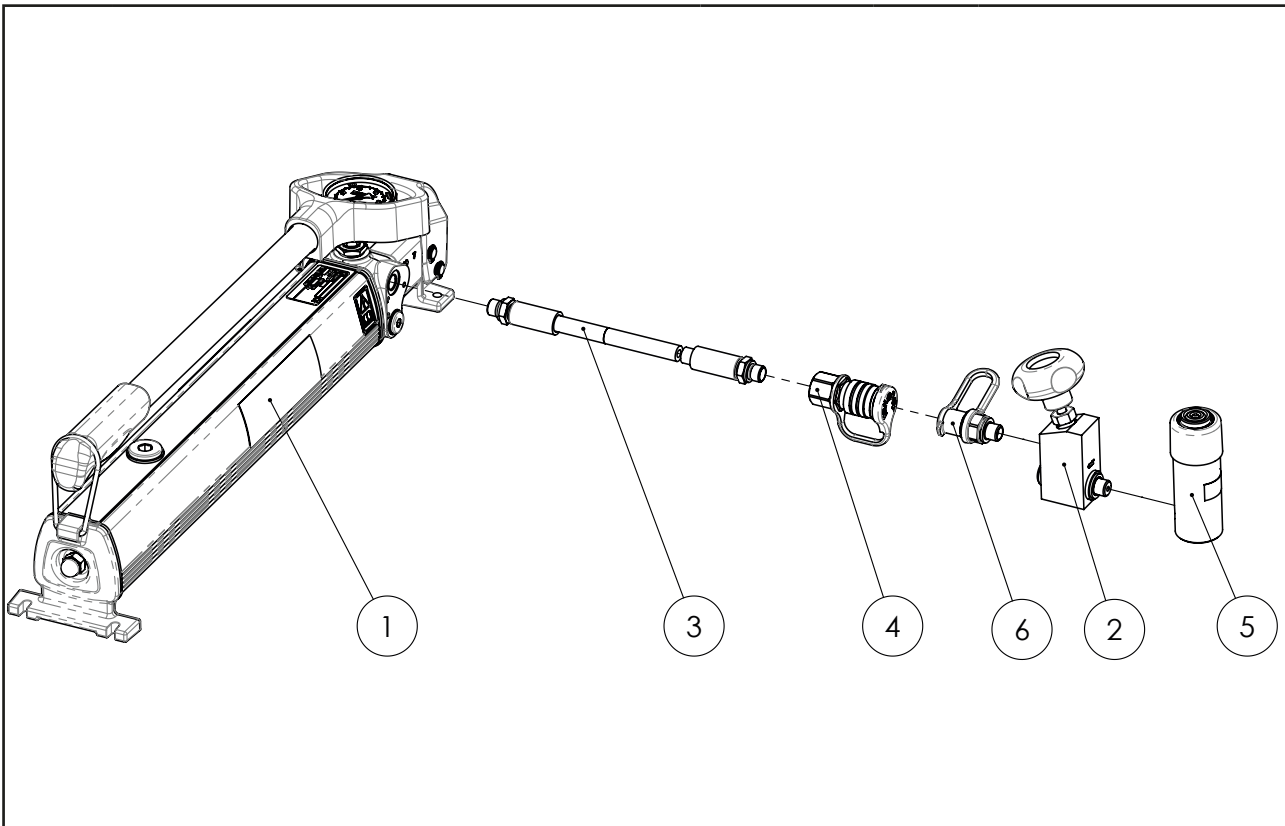
No.	Description	Part.no	Qty	More information
1	PHS70-series		1	
2	ATU4	46785	1	
3	Hose (LSxxxES)		4	
4	AQI7 (Female quick coupling)*	46014	4	
5	Single acting cylinder		4	
6	VA80	46787	4	
7	AMP650, AMP651, AMP652		1	
8	Plug 700 bar	8539		No gauge

Extra information:

- If no gauge will be used, seal with plug #8.
- Oil container larger than 1 liter on PHS pump require 3x extra nipple: AAE502 and 2x washer 17009.
- Hose (LSxxxES) and nipple AAI456 between PHS pump and ATU4, due to askew center of gravity.
- Open or shut valve, no inbetween.
- For gauge on each port, add TX111 (TX102 gauge) or ATM214 (AMT801, TX104 gauge).
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Shut-off valve with built in check valve VAB114



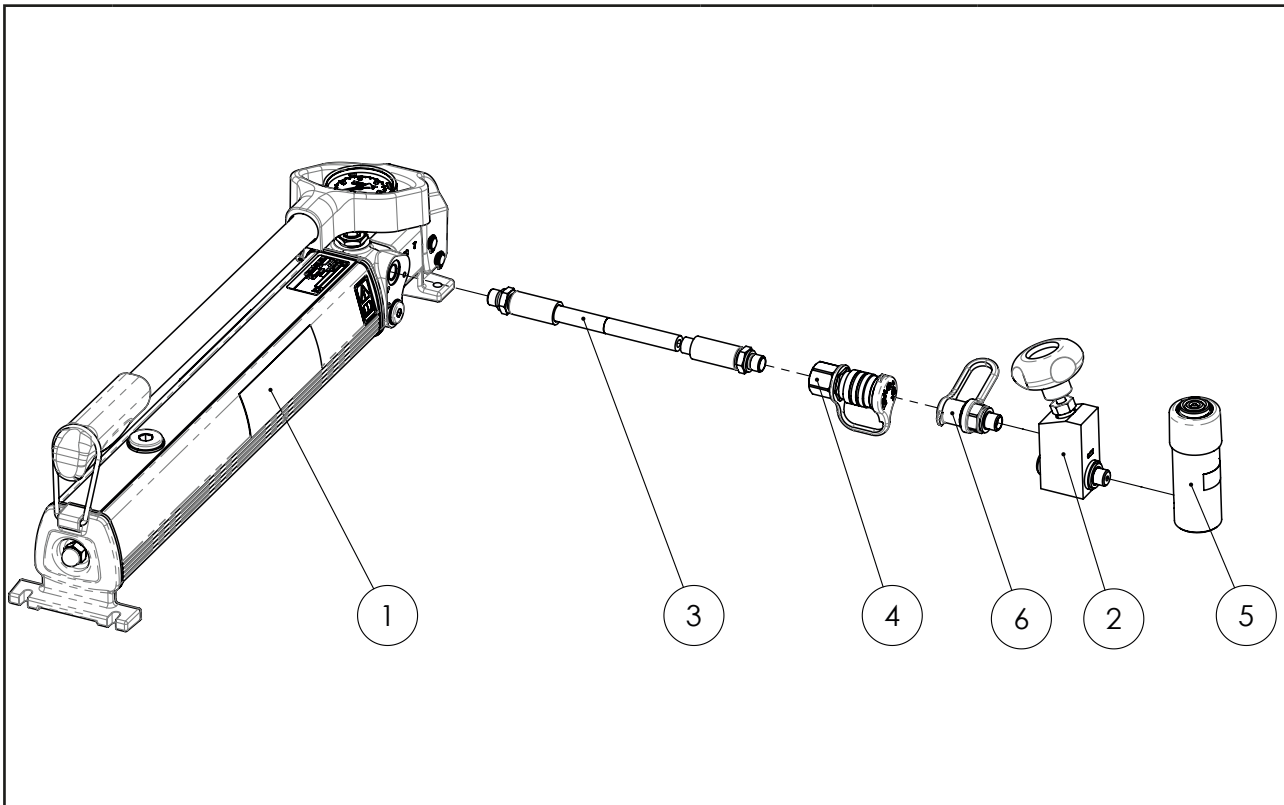
No.	Description	Part.no	Qty	More information
1	PHS70-series		1	
2	VAB114	38918	1	
3	Hose (LSxxxES)		1	
4	AQI7 (Female quick coupling)	46014	1	
5	Single acting cylinder		1	
6	AQU8	45952	1	On cylinder

Extra information:

- Remove the quick coupling #6 on the cylinder in order to fit VAB114 directly and attach the quick coupling on VAB114 #2.
- For G1/4" thread, torque 50 Nm.

**Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.*

Shut-off valve VA14 with built-in hose rupture QC



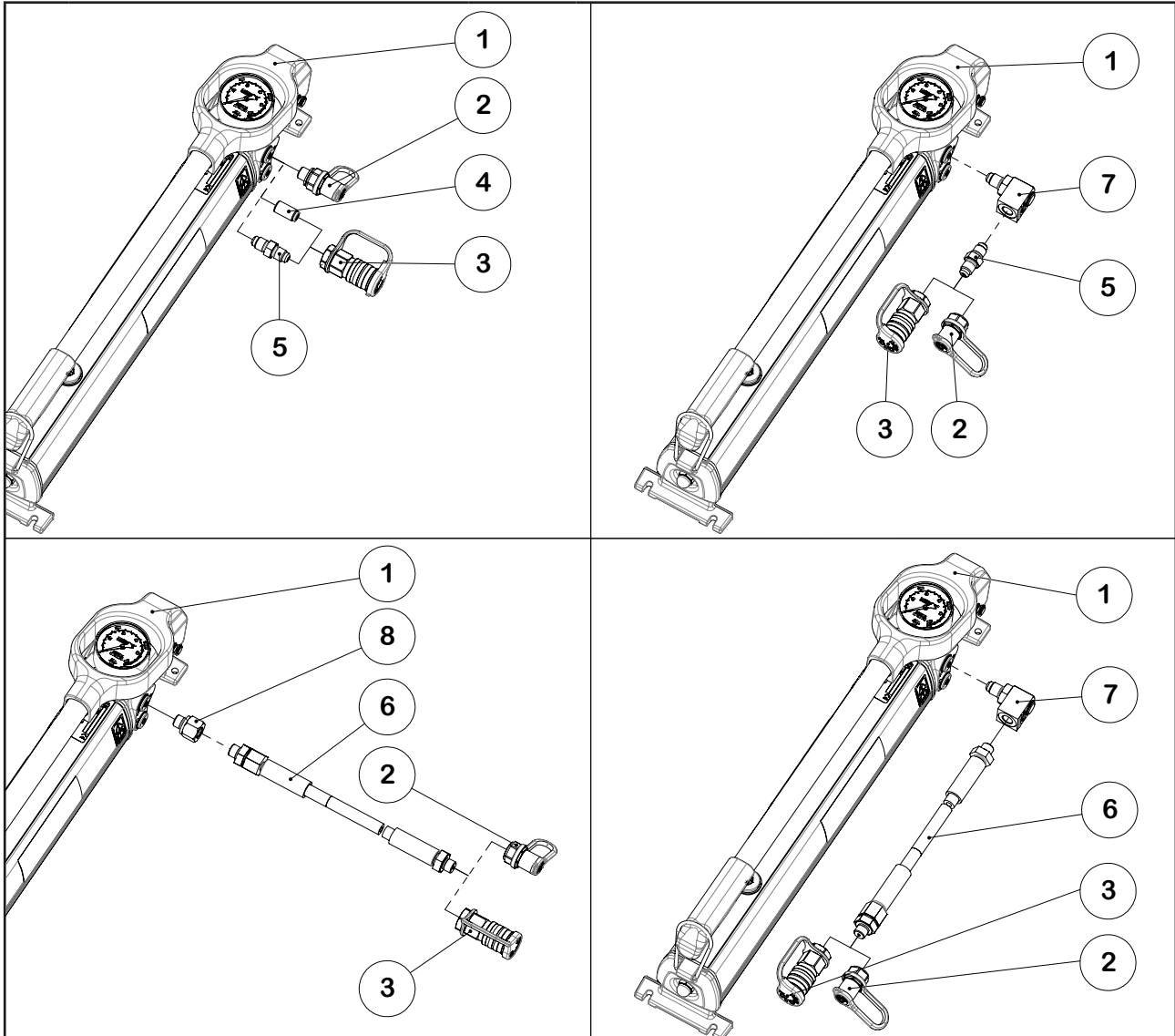
No.	Description	Part.no	Qty	More information
1	PHS70-series		1	
2	VA14	27072	1	
3	Hose (LSxxxES)		1	
4	AQI7 (Female quick coupling)	46014	1	
5	Single acting cylinder		1	
6	AQU10-S		1	38815900

Extra information:

- Remove the quick coupling AQU8 on the cylinder in order to fit VA14 directly and attach the quick coupling AQU10-S #6 on VA14.
- AQU10-S has a built-in hose rupture valve.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Accessories for PHS150-series

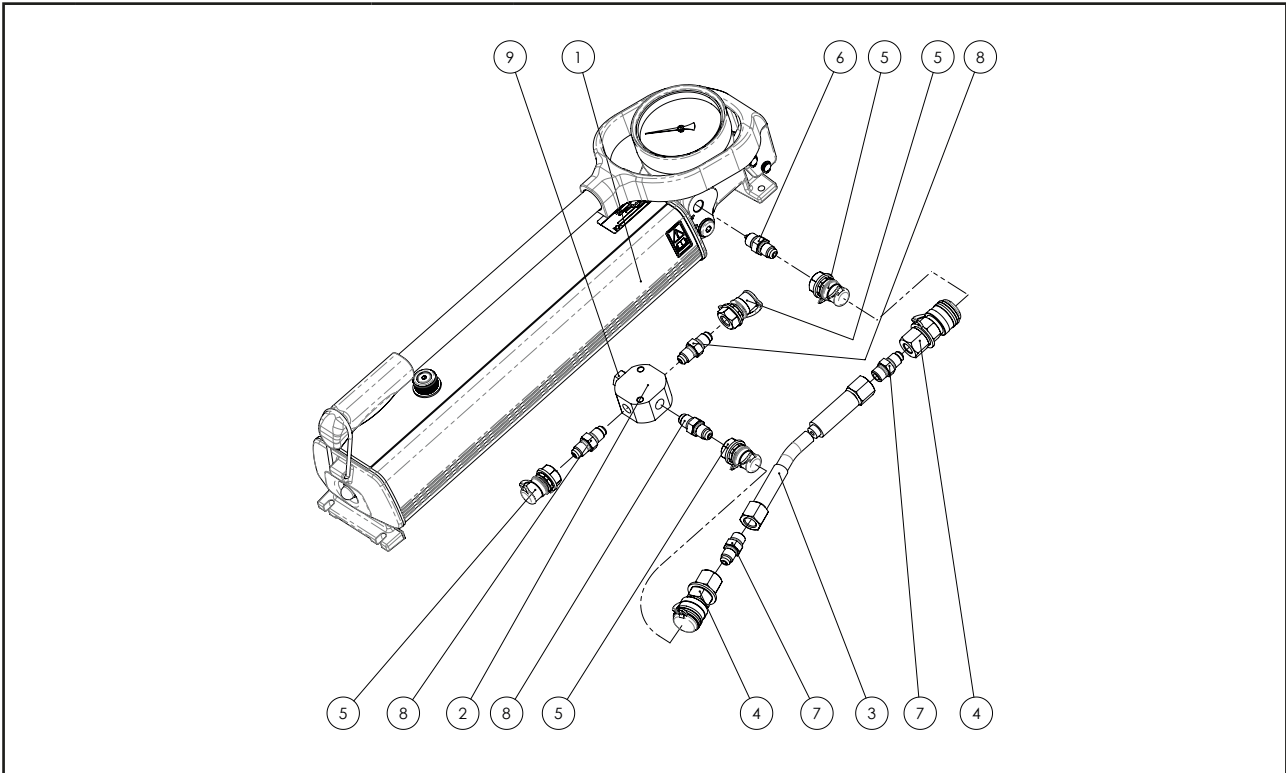


No.	Description	Art.no	More information
1	PHS150-series		1 Tredo/seal in pressure port at delivery
2	AQU150 quick coupling, male	46573	Adapter AAU436 and 1pcs Tredo/seal included, adapter can be removed for internal thread
3	AQI150 quick coupling, female	49450	No Tredo/seal included
4	AAU436 adapter	20737	Require Tredo/seal
5	AAU243 adapter	45043	Metal-to-metal sealing, no Tredo/seal required
6	Hose 150 MPa	-	Countersunk Tredo/seal on both sides
7	ASE15 Swivel coupling	45962	Only Tredo when used with hose, other metal-metal
8	AAE502 Adapter	28613	Require Tredo/seals, both sides

Extra information:

- Manifold ATI32 can be attached directly on PHS150-1000/2400/4100. For ATI3 & ATI31 directly on PHS150-1000, for PHS150-2400 add 1 pcs of AAE504 adapter.
- Torque 50 Nm
- NOTE! Never have 2pcs of Tredo/seals together.

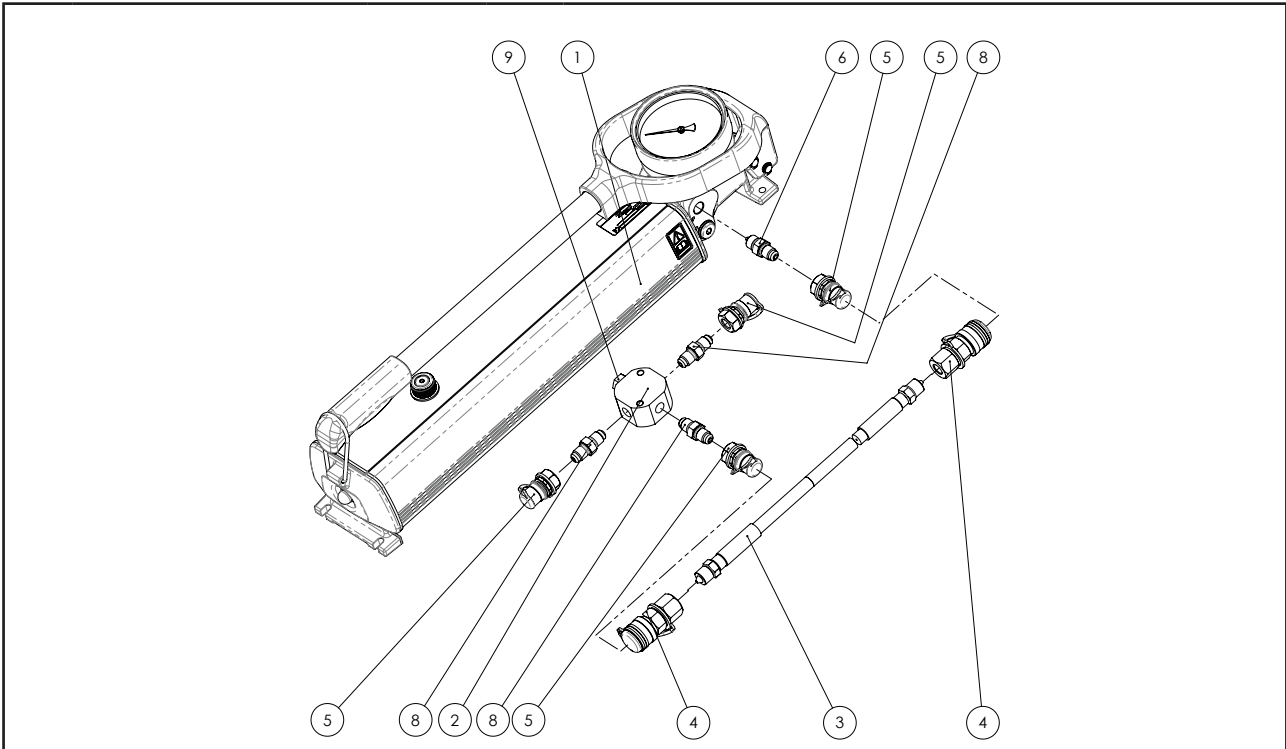
PHS200-, PHS240-



No.	Description	Part.no	Qty	More information
1	PHS240-series		1	
2	AF41	45048	1	
3	Hose (LSx04ER)		1	
4	AQI250	46574	2	Torque 50 Nm
5	AQU250	46575	4	Torque 50 Nm
6	Nipple AAU241	38433	1	Torque 35 Nm
7	Nipple AAU242	45042	2	Torque 35 Nm
8	Nipple AAU243	45043	3	Torque 50 Nm
9	Plug 300 MPa	50569		In order to plug the AF41, if not all ports will be used in the application, torque 50 Nm (1 plug included in AF41 as standard)

Extra information:
-

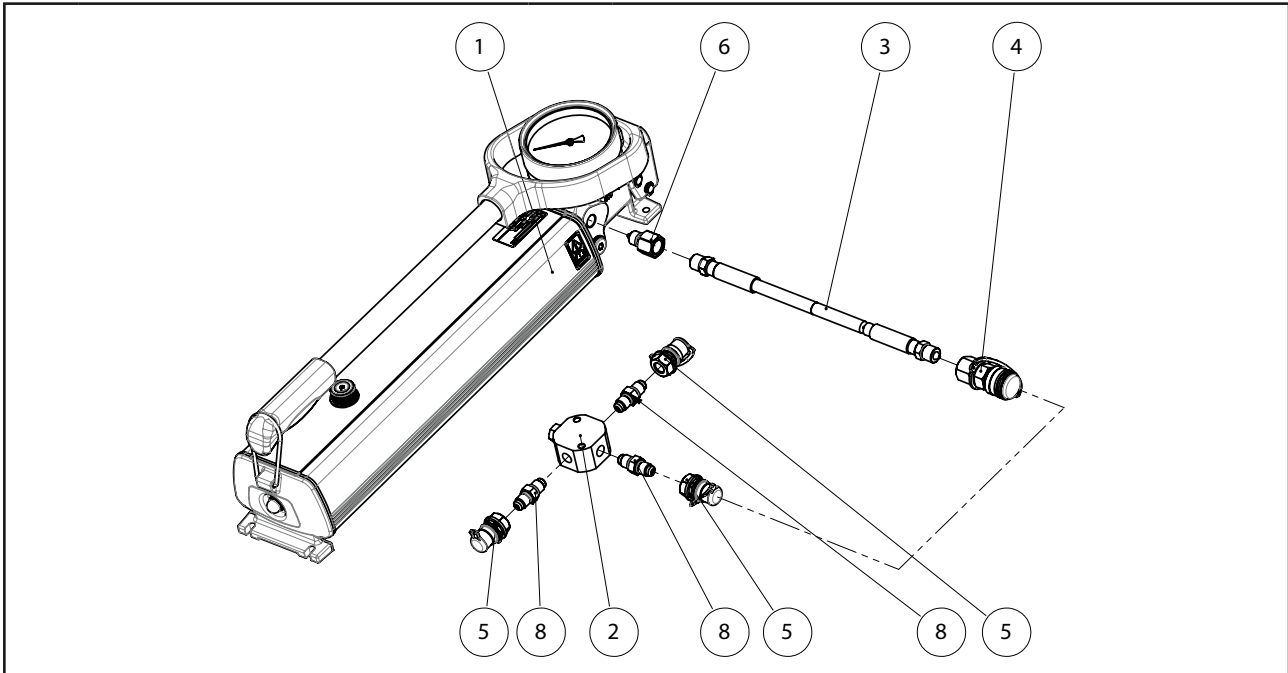
PHS280-



No.	Description	Art.no	Qty	More information
1	PHS280-series		1	
2	AF41	45048	1	
3	Hose (LS205EB)	51228	1	
4	AQI300	50843	2	Torque 35 Nm
5	AQU300	50844	4	Torque 35 Nm
6	Nipple AAU244	50842	1	Torque 35 Nm
8	Nipple AAU245	51269	3	Torque 50 Nm
9	Plug 300 MPa	50569		In order to plug the AF41, if not all ports will be used in the application, torque 50 Nm (1 plug included in AF41 as standard).

Extra information:
-

PHS280- Alternative assembly

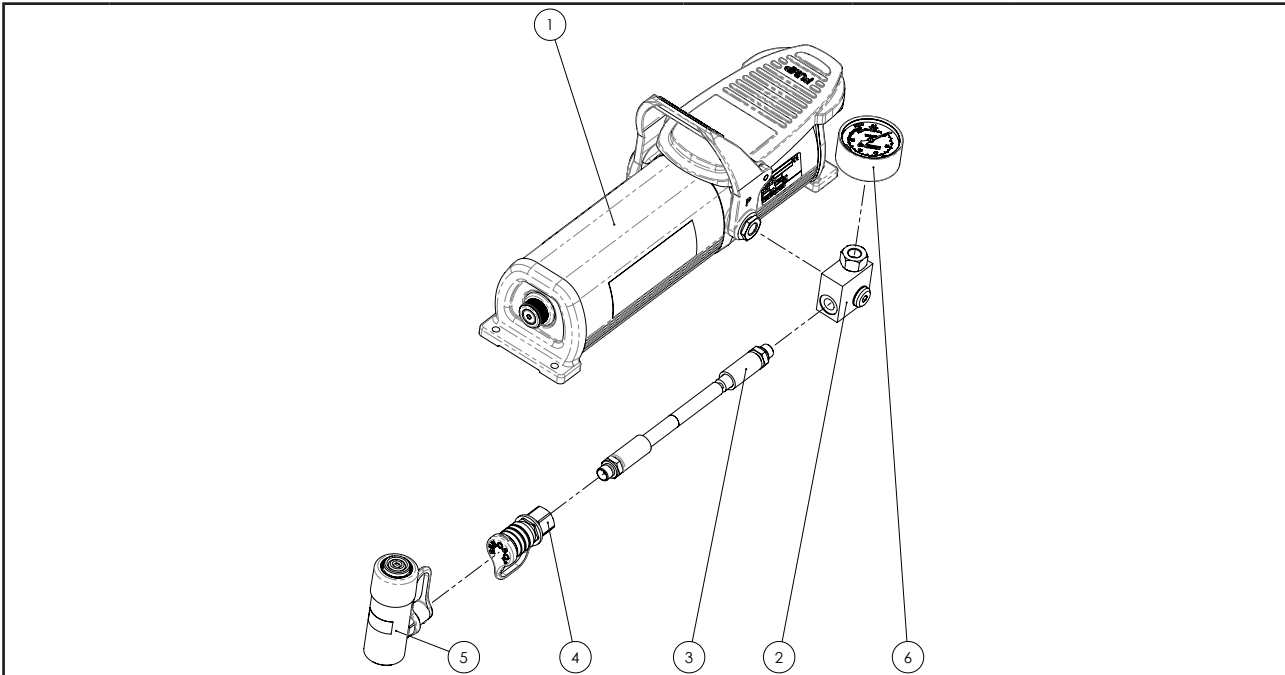


No.	Description	Art.no	Qty	More information
1	PHS280-series		1	
2	AF41	45048	1	
3	Hose (LS205EB)	51228	1	
4	AQI300	50843	1	Torque 35 Nm
5	AQU300	50844	3	Torque 35 Nm
6	Nipple AAU506	51439	1	Torque 35 Nm
8	Nipple AAU245	51269	3	Torque 50 Nm
9	Plug 300 MPa	50569		In order to plug the AF41, if not all ports will be used in the application, torque 50 Nm (1 plug included in AF41 as standard).

Extra information:

- Solution with quick couplings mounted on pump, please see page 15
- Quick coupling AQI300 & AQU300 can be pressurized a maximum of 1000 times.

Attach gauge onto PP70-1000-series



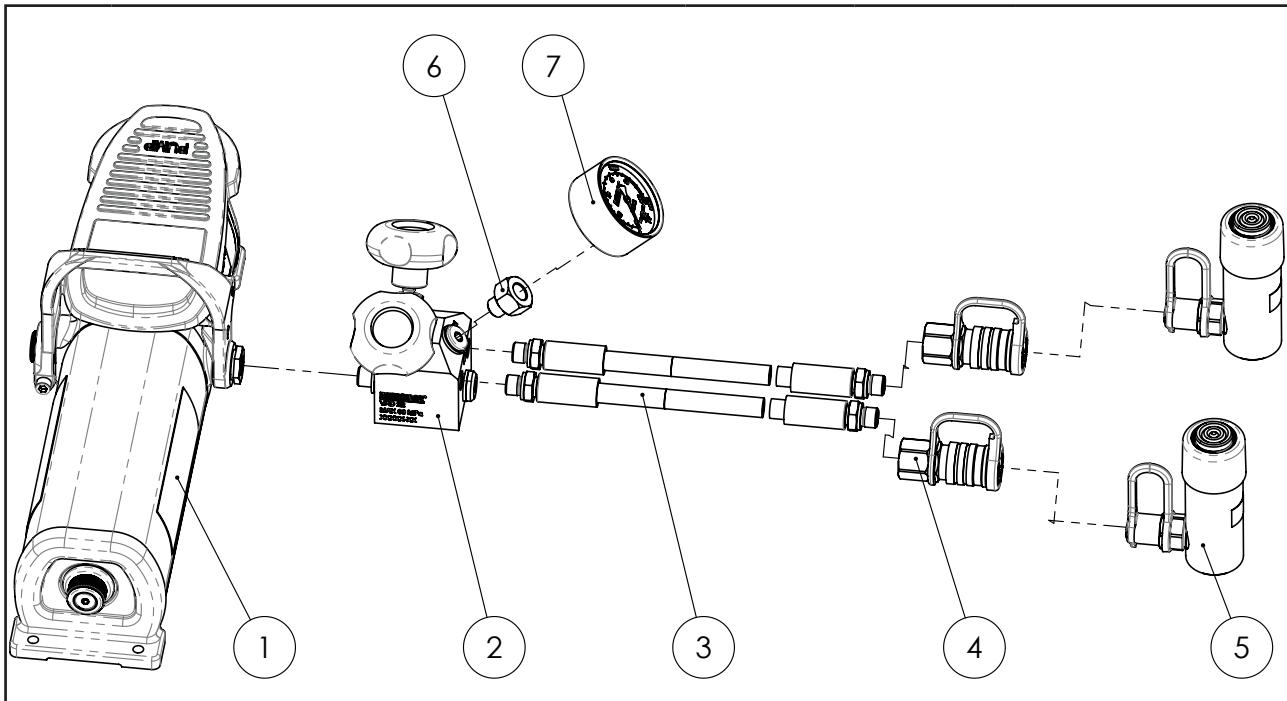
No.	Description	Part.no	Qty	More information
1	PP70-1000series		1	
2	AVM204	38892	1	
3	Hose (LSxxxES)		1	
4	AQI7 (Female quick coupling)*	46014	1	
5	Single acting cylinder		1	
6	AMT801, TX104		1	

Extra information:

- For working pressure 70 MPa.
- Enables reading of the pressure.
- AMT801, pressure range: 100 MPa.
- TX104, pressure range: 160 MPa.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Control two cylinders at the same time



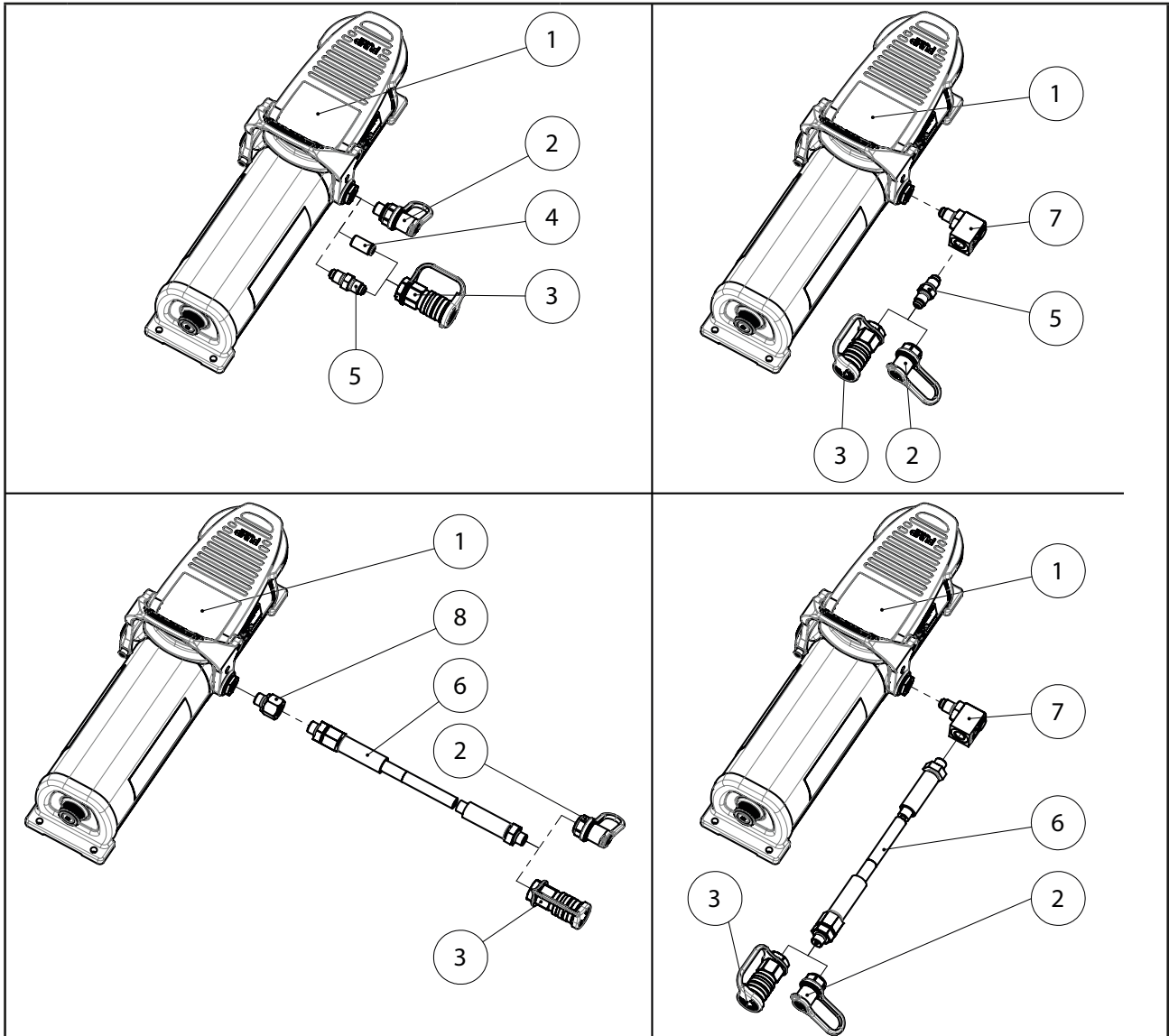
No.	Description	Part.no	Qty	More information
1	PP70B-1000	49300	1	
2	VAD22	19093	1	
3	Hose (LSxxxES)		2	
4	AQI7 (Female quick coupling)*	46014	2	
5	Single acting cylinder		2	
6	Gague adapter AAM14	38245	1	
7	AMT801, TX104		1	

Extra information:

- For working pressure 70 MPa.
- Enables reading of the pressure.
- AMT801, pressure range: 100 MPa.
- TX104, pressure range: 160 MPa.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

Accessories for PP150-1000

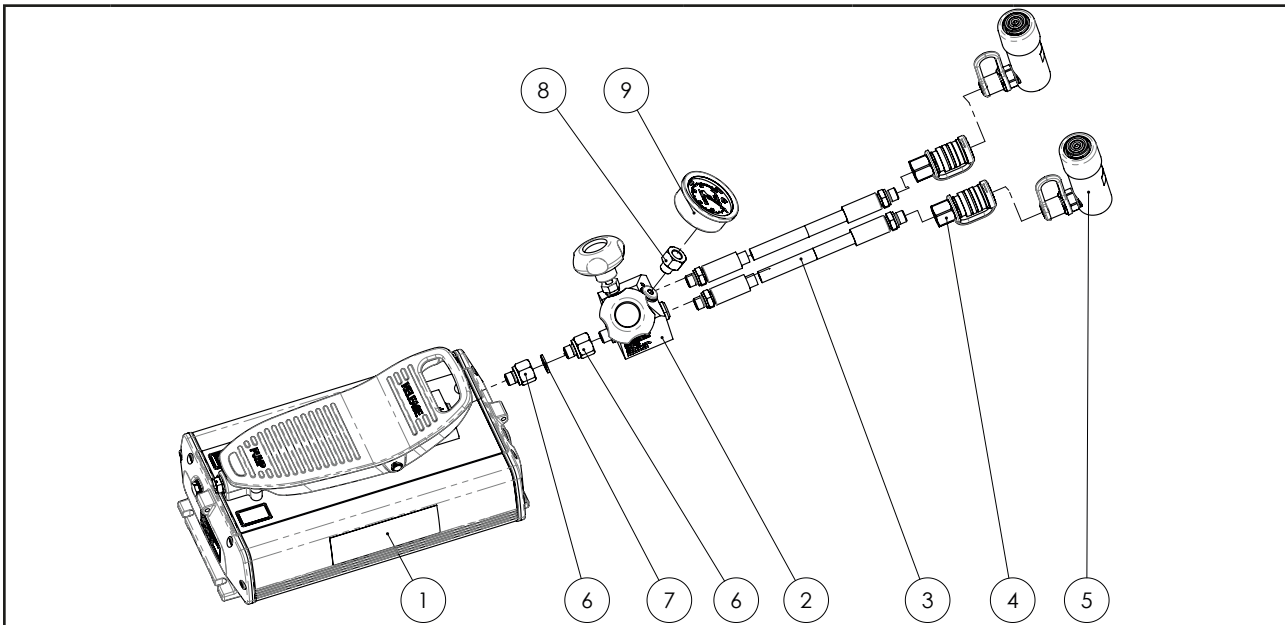


No.	Description	Art.no	More information
1	PP150-1000		1 Tredo/seal in pressure port at delivery
2	AQU150 quick coupling, male	46573	Adapter AAU436 and 1pcs Tredo/seal included, adapter can be removed for internal thread
3	AQI150 quick coupling, female	49450	No Tredo/seal included
4	AAU436 adapter	20737	Require Tredo/seal
5	AAU243 adapter	45043	Metal-to-metal sealing, no Tredo/seal required
6	Hose 150 MPa	-	Countersunk Tredo/seal on both sides
7	ASE15 Swivel coupling	45962	Only Tredo when used with hose, other metal-metal
8	AAE502 Adapter	28613	Require Tredo/seals, both sides

Extra information:

- Manifold ATI32, ATI3 & ATI31 can be mounted directly on PP150-1000
- Torque 50 Nm
- NOTE! Never have 2pcs of Tredo/seals together.

Control two cylinders at the same time



No.	Description	Part.no	Qty	More information
1	PP70-2500FP		1	
2	VAD22	19093	1	
3	Hose (LSxxxES)		2	
4	AQI7 (Female quick coupling)*	46014	2	
5	Single acting cylinder		2	
6	Nipple AAE502	28613	2	
7	Washer	17009	1	
8	Gague adapter AAM14	38245	1	
9	AMT801, TX104		1	

Extra information:

- Enables reading of the pressure.
- AMT801, pressure range: 100 MPa.
- TX104, pressure range: 160 MPa.
- For G1/4" thread, torque 50 Nm.

*Can be exchanged to screw-in AQI24 male quick coupling (adaptor AAI456 for internal G1/4") for female quick coupling AQU25.

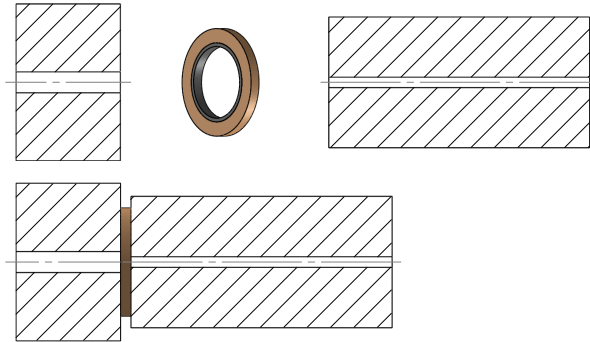
Different sealing methods

There are three different sealing methods depending on the pressure. It is crucial to ensure a proper sealing method to be able to create a hydraulic system without leakage.

0-700 bar

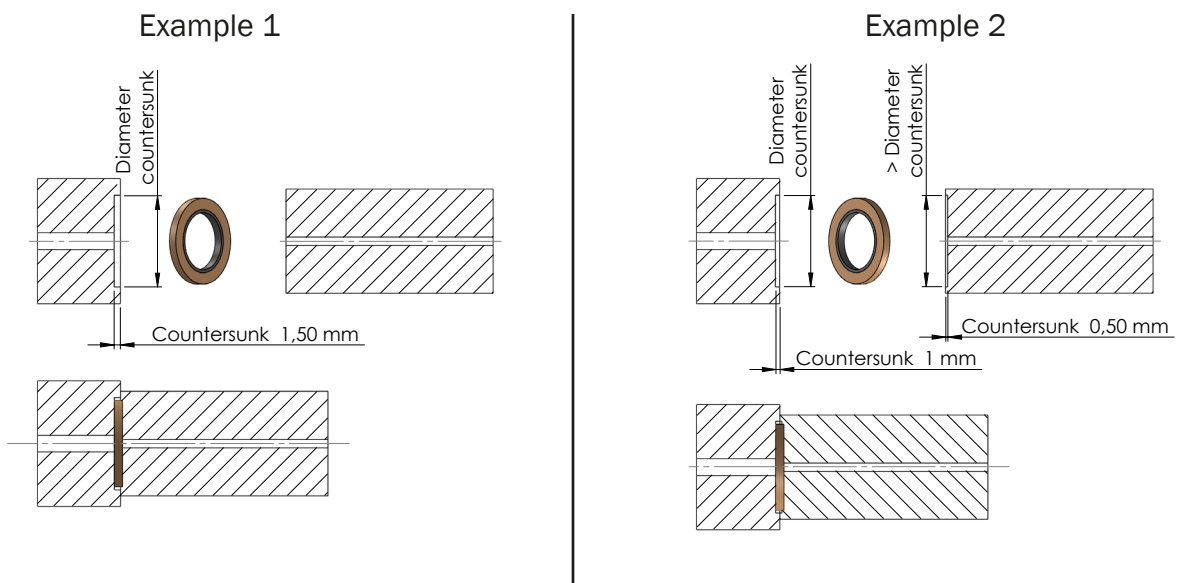
The sealing method for 0-700 bar is a rubber-metal washer that needs to be placed between the components in the system.

Seal type	Part no.	For thread
1	01044650	G1/8"
2	17009	G1/4"
3	16217	G3/8"
4	14192	G1/2"



700-1600 bar

The sealing method for 700-1600 bar is a rubber-metal washer that needs to be placed between the components in the system with a countersunk of maximum 1,5 mm on one of the components, see example 1.



Note 1: This principle can even be used on lower pressure.

Note 2: The principle still works if there is a countersunk on both components but no larger than 1,5 mm, see example 2. Also, the diameter of the greatest countersunk needs to be a certain dimension, the diameter of the opposite countersunk needs to be larger, see table below.

Seal type	Part no.	For thread	Diameter countersunk [mm]
1	01044650	G1/8"	15,9 +0,1
2	17009	G1/4"	20,6 +0,1
3	16217	G3/8"	23,9 +0,1
4	14192	G1/2"	28,6 +0,1

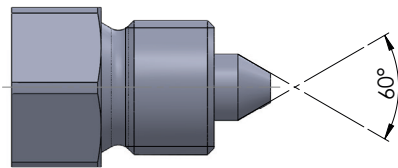
Different sealing methods

There are three different sealing methods depending on the pressure. It is crucial to ensure a proper sealing method to be able to create a hydraulic system without leakage.

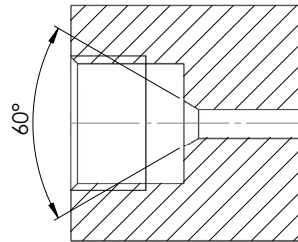
1600-2800 bar

The sealing method for 1600-2800 bar needs a conical sealing principle which means metal against metal. There are three different metal against metal sealing techniques, make sure you select the correct one for your hydraulic system.

1. 1600-2800 bar

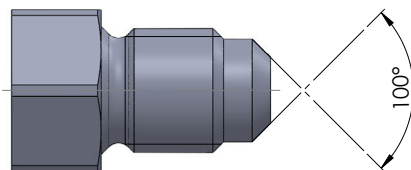


External thread:
connection with 60° external cone

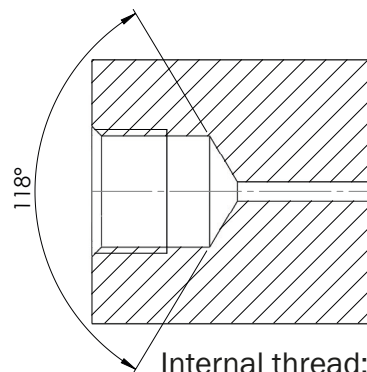


Internal thread:
connection with 60° internal cone

2. 1600-2800 bar

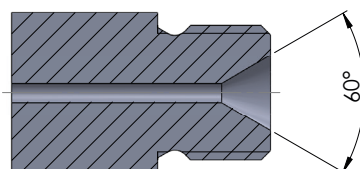


External thread:
connection with 120° external cone

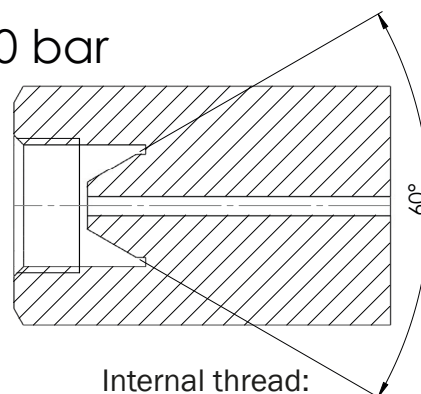


Internal thread:
connection with 120° internal cone

3. 1600-2500 bar



External thread:
connection with 60° internal cone



Internal thread:
connection with 60° internal cone

Seal type	Torque [Nm]
1	35 Nm
2	60 Nm
3	35 Nm

Note: These principles can be used on lower pressure as well.

Oil types and viscosity in REHOBOT pumps

Hydraulic oil of high quality guarantees excellent functionality for your hydraulic system.

The viscosity will determine how easily the oil is pumped within the working pump and how quickly it will drain back to the tank. The lower viscosity the easier all this will happen. An oil with too high viscosity will have a negative effect on the pump's ability to suck oil into the pump house while pumping. This will result in a lower stroke volume than specified, and can even make it impossible to pump the oil.

As standard, all REHOBOT pumps is filled with ISO VG10 which can be used in -20°C and up to +50°C. Using oils with another viscosity will change the temperature span.

Technical documentation: Detailed datasheet on our hydraulic oil is [available here](#).

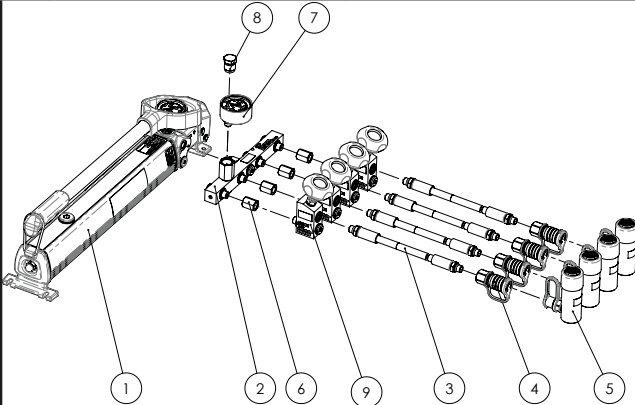
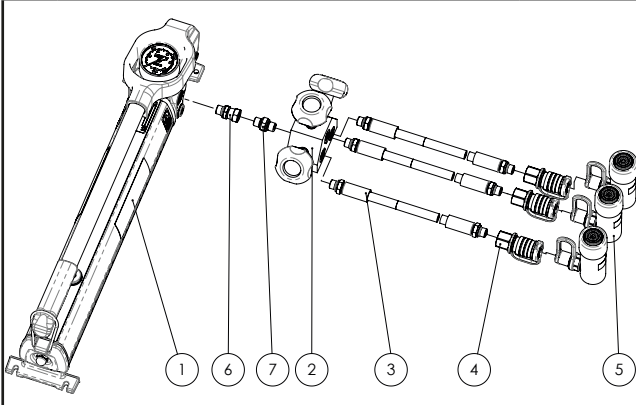
Parallel / synchronous lifting applications

A common situation with hydraulics is lifting a unit with several lifting points. All the cylinders needs to operate uniformly so the load will be lifted at the same rate at each lifting point. Applying pressure into a hydraulic cylinder will make the cylinder lift at its own rate, depending on the load and force required. With several cylinders connected, the liquid will always move to the lightest load first and a cylinder with a heavier load will move last.

If synchronous lifting is a requirement for the application, we have different alternatives:

Alternative 1:

Depending on the application and the number of cylinders required, our shut-off valves can be an alternative in which you can controll each cylinder manually so that the load is lifted at the same rate during the entire stroke. See our shut-off valve section.

Connect 4 cylinders with shut off valve VA14 and manifold ATU4					Connect 3 cylinders with the VAT3 Shut-off valve and PHS-series				
									
No.	Description	Part.no	Qty	More information	No.	Description	Part.no	Qty	More information
1	PHS70-series		1		1	PHS70-series		1	
2	ATU4	46785	1		2	VAT3	19094	1	
3	Hose (LSxxxES)		4		3	Hose (LSxxxES)		3	
4	AQI7 (Female quick coupling)*	46014	4		4	AQI7 (Female quick coupling)*	46014	3	
5	Single acting cylinder		4		5	Single acting cylinder		3	
6	Nipple AAI456	19905	4		6	Nipple AAE505	37721	1	
7	AMP650, AMP651, AMP652		1		7	Nipple AAU406	47469	1	
8	Plug 700 bar	8539		No gauge	Extra information: - Sviweling connection for VAT3, decide yourself how you want the shut-off handles. - For G1/4" thread, torque 50 Nm.				
9	VA14	27072	4						
Extra information: - If no gauge will be used, seal with plug #8. - Oil container larger than 1 liter on PHS pump require 3x extra nipple: AAE502 and 2x washer 17009. - Hose between PHS pump and ATU4, due to askew center of gravity. - For gauge on each port, add TX111 (TX102 gauge) or ATM214 (AMT801, TX104 gauge). - For G1/4" thread, torque 50 Nm.									

Alternative 2:

A common solution is to use one pump for each cylinder. With this solution, you can lift your application by focusing on each lifting point by a separate pump.