Pump Manual

HY Series Progressive Lubrication Pump

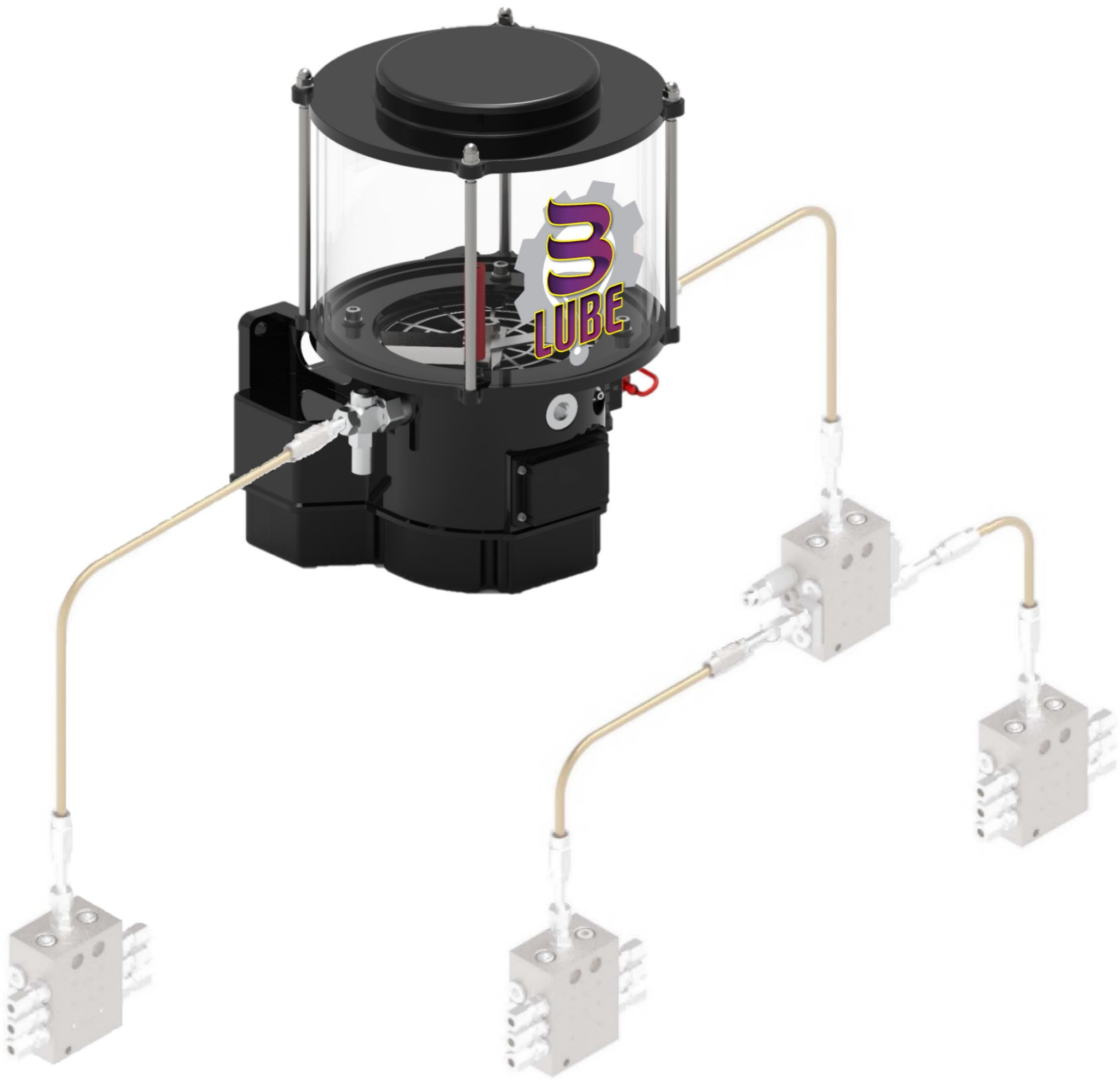
Index

Overview

The B Lube HY Series Progressive Lubrication Pump stands as an innovative and essential component within modern industrial machinery maintenance.

The B Lube HY series system excels at eliminating manual lubrication processes that are prone to inconsistencies and downtime.
These systems deliver precise amounts of lubricant at optimal intervals, they effectively reduce friction, wear, and heat, while also preventing corrosion and shock load within machines components.

The B Lube HY series is a versatile option suitable for various industries, including transport, construction, mining, agriculture, wind power, manufacturing, ports and much more.
With its intelligent design and state-of-the-art technology, these automatic lubrication systems are a crucial tool in reducing maintenance efforts to extend vital machinery lifespan, and ultimately contribute to increased operational efficiency across the board.



Dia. 3.1 System Layout for
HY Series Progressive Lubrication Pump + Progressive Dividers

Overview

B Lube progressive central lubrication pump is electronically operated and has up to a maximum of 4 independently operating lubricant outlets, which can be engaged by bypasses.
A separate pump element PE is required for each outlet.
Four different delivery rates are available (**Ref. Page 6**).
This allows the grease quantity to be metered precisely for the requirements of the individual progressive divider layouts.
These pumps enable the delivery of lubricants up to
NLGI- grade 2 at a working pressure of maximum 300 bar.

** For advice on recommended grease for B Lube systems that best suites your needs please contact us.*

Dia. 4.1 Pump with 2 litre - Outside Diameter of Reservoir: 160mm

The B Lube HY series pumps differ in reservoir size and control type.
It can be controlled by the standard integrated controller with current version LC01*, or externally by PLC, board computer or external controller from B Lube.

Technical data:

Nidec Motor:		
Operating Voltage:	12V DC ±10%	24V DC ±10%
Revolutions:		20 rpm
Relative duty cycle:		30% ED S3 30 minutes
Current consumption at +20°C:		
Idling:	1A	0.6A
Full load:	5A	3A
Fuse:	10A	6A
Pump:		
Max. number of pump elements:		4
Max. Operating pressure:		350 bar
Adjusting of pressure relief valve till:		300 bar
Permissible operating temperature:		-40°C to +70°C
Sound pressure level		<50 dB
Reservoir size:		2/4/8/10/12/15/20 L
Mounting position:		Vertical
Protection type:		IP65 as per ISO
Lubricant:		Greases up to NLGI- Grade.2

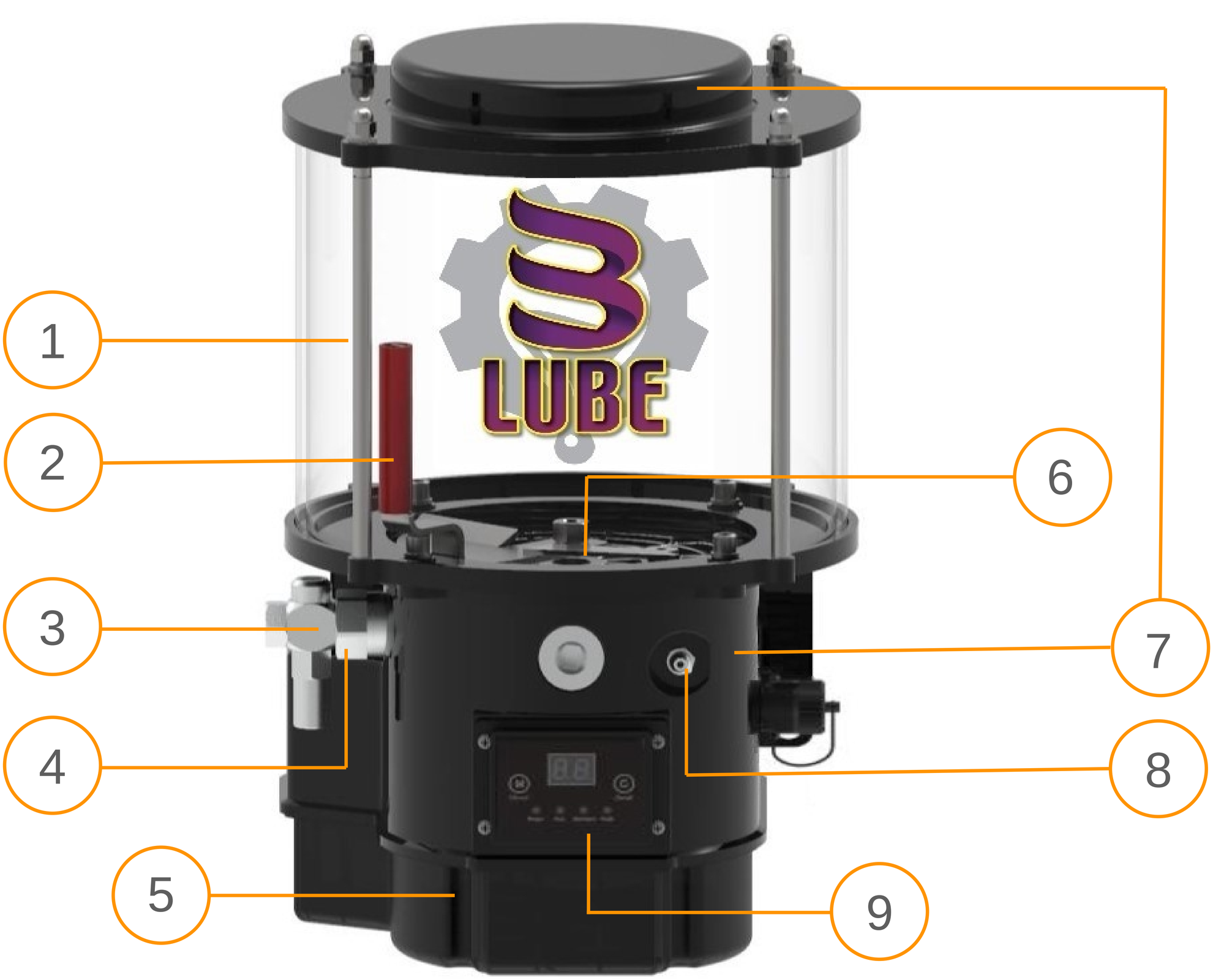
Dia. 4.2 *Pump with 4/8/10/12/15/20 litre - Outside Diameter of Reservoir : 220 mm*

Working Principle

The B Lube electric lubricating pump consists of

- ☐ Built-in DC motor
- ☐ Refilling point
- ☐ Pump element
- ☐ Red stirring paddle
- ☐ Grease reservoir
- ☐ Metal Housing
- ☐ Relief valve
- ☐ Low Level Sensor
- ☐ Integrated controller

A gear DC motor continually rotates an eccentric pressure disc.
As the EPD passes it pushes the piston of the pump element causing suction and pressure strokes of the delivery piston, the integrated non-return valve prevents the Lubricant from being sucked back into the pump.
The red paddle stirrer pushes the lubricant out of the grease reservoir through a metal screen, which reduces any air bubbles to the suction area in the pump body.
The red paddle stirrer enables a visual check of the lubricant volume still present in the transparent grease reservoir, as well the low level sensor indicates a fault of E4 on controller when grease is low.
The Relief valve is pre-set to 300 bar, acting as a safeguard against any potential excessive pressure build-up within the system.



1.Grease reservoir 2.Red stirring paddle 3.Relief valve
4.Pump Element 5.Built-in Nidec DC motor 6.Low level sensor
7.Metal Housing 8.Refilling point 9.Integrated controller

Dia. 5.1 Pump working principle

Pump Element

B Lube HY series pumps can be installed with (max) 4 pump elements with type C relief valve (RV-C) on the pump outlet position.

1/2/3/4 Pump elements can deliver the grease separately with the flow rate range between 2.0-4.5 cm³/min.

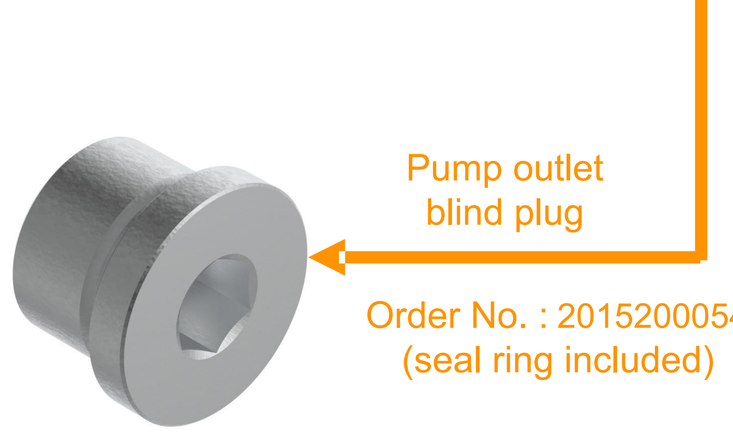
Elements can be bridged with each other to achieve a higher flow rate till (max)13.5 cm³/min with RV-C relief valve.

** Note RV-C must be installed on all operating pump elements.*

** For customised flow rate of pump elements please contact us.*

** For more information of pump elements bridge please contact us.*

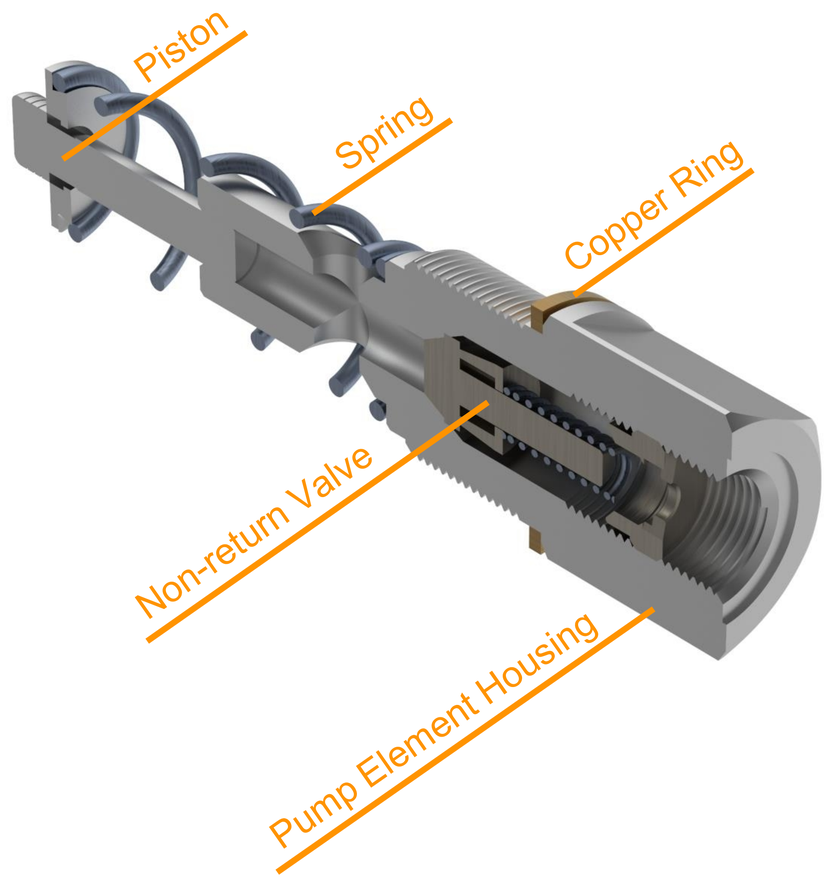
Dia. 6.1 Pump outlets position



Technical Data Pump Element (without relief valve):

PE	Fixed delivery quantity (cm³/min)	Order No. *	Connecting thread
PE 2.0	2.0	2410400030	M22x1.5
PE 2.8	2.8	2410400020	M22x1.5
PE 4.0	4.0	2410400010	M22x1.5
PE 4.5	4.5	2410400080	M22x1.5

** Order No. for PE2.0/2.8/4.0/4.5 includes Copper Ring already, but without relief valve.*



Dia. 6.2 Pump Element structure

Pump Element

Function of the Pump Element

On the vertical shaft of the geared DC motor an eccentric pressure disc EPD with eccentric hole in the centre is mounted.
When the pump starts running the EPD will make a back-and-forth movement (**X1,X2,X3**).
The pump element is mounted in the pump body the piston of the pump element will run against the EPD.

When the EDP is moving away from the piston(***Dia.7.1-1***), the spring on the pump element will push the piston against the EPD.
In this suction stroke grease is sucked into the pump element through the 2 suction holes.

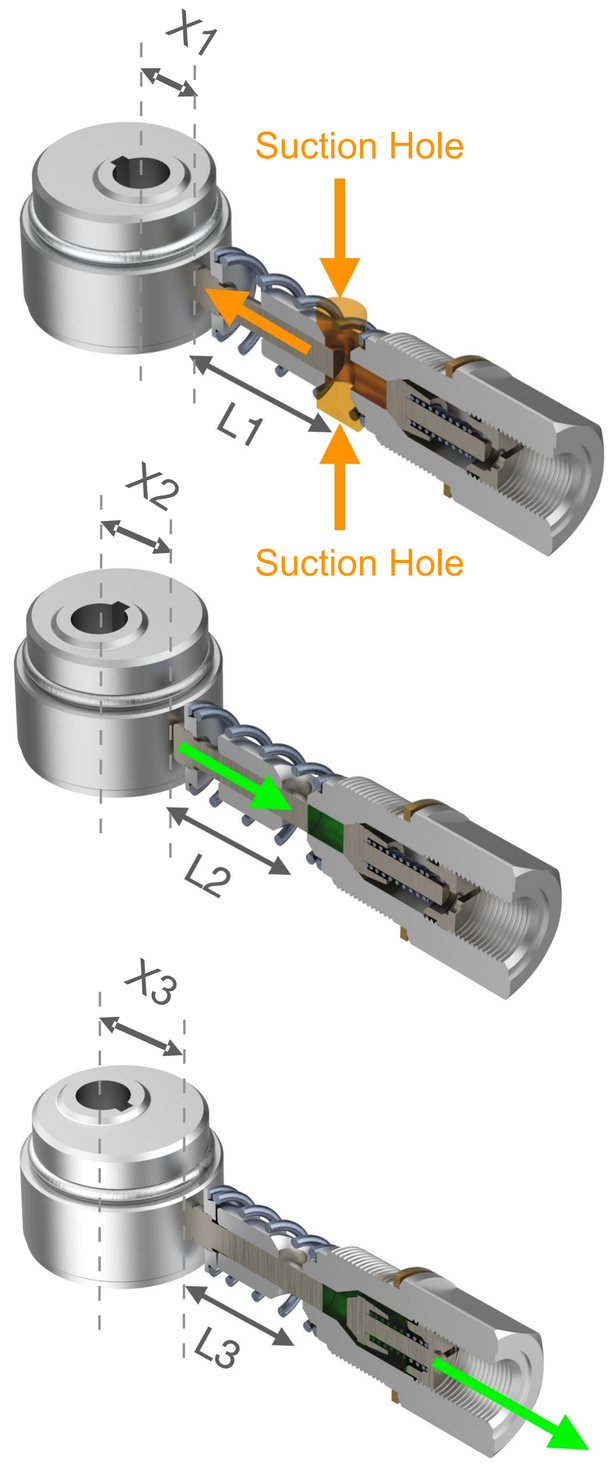
See the 2 arrows in (***Dia. 7.1-1***). The vertical shaft will continue rotating and the EPD will push the piston into the other direction (***Dia.7.1-2***).
In this pump stroke the piston will close the 2 suction holes and pushes the suctioned grease to the non-return valve.

The pressure created by the piston and grease will open the non-return valve (***Dia.7.1-3***) and the grease flows to the outlet of the pump element further into the lubrication system.

7.1-1

7.1-2

7.1-3



Dia. 7.1 Pump Element Working Principle

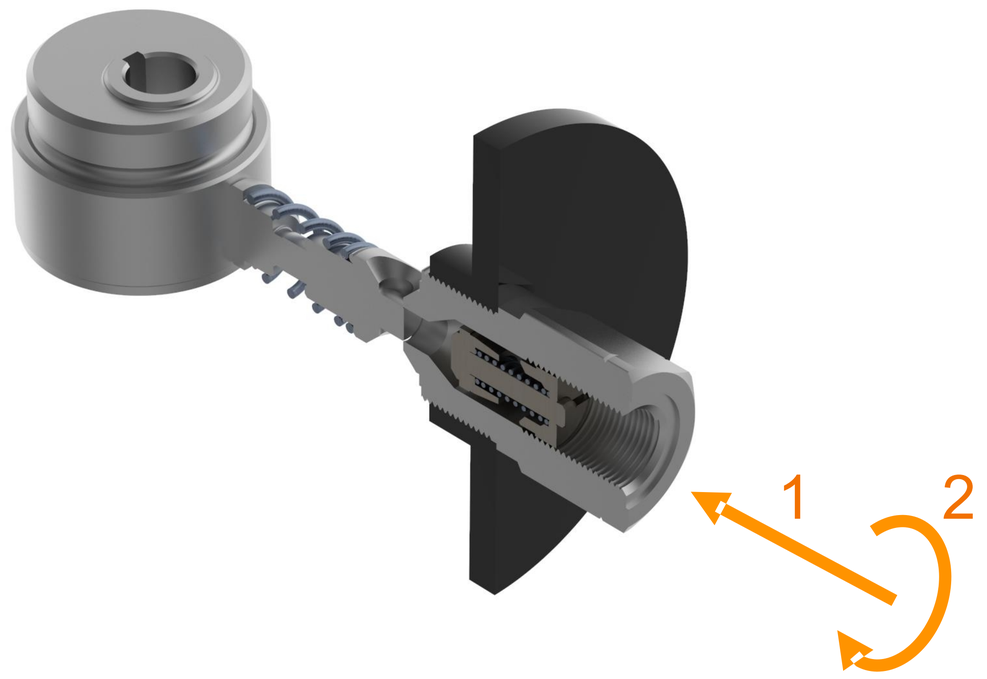
Pump Element Installation and Removal

1. Insert the pump element vertically into the pump outlet housing drilling (***Dia. 7.2***).

2. Tighten the pump element clockwise with a torque wrench. The preset value of the torque wrench can not be less than 25 N/m (***Dia. 7.2***).

3. For removal, reserve above sequence.

Only install or remove the pump element when pump power is OFF!!!



Dia. 7.2 Pump Element installation and removal

Relief Valve Type C: RV-C for PE (Standard Version)

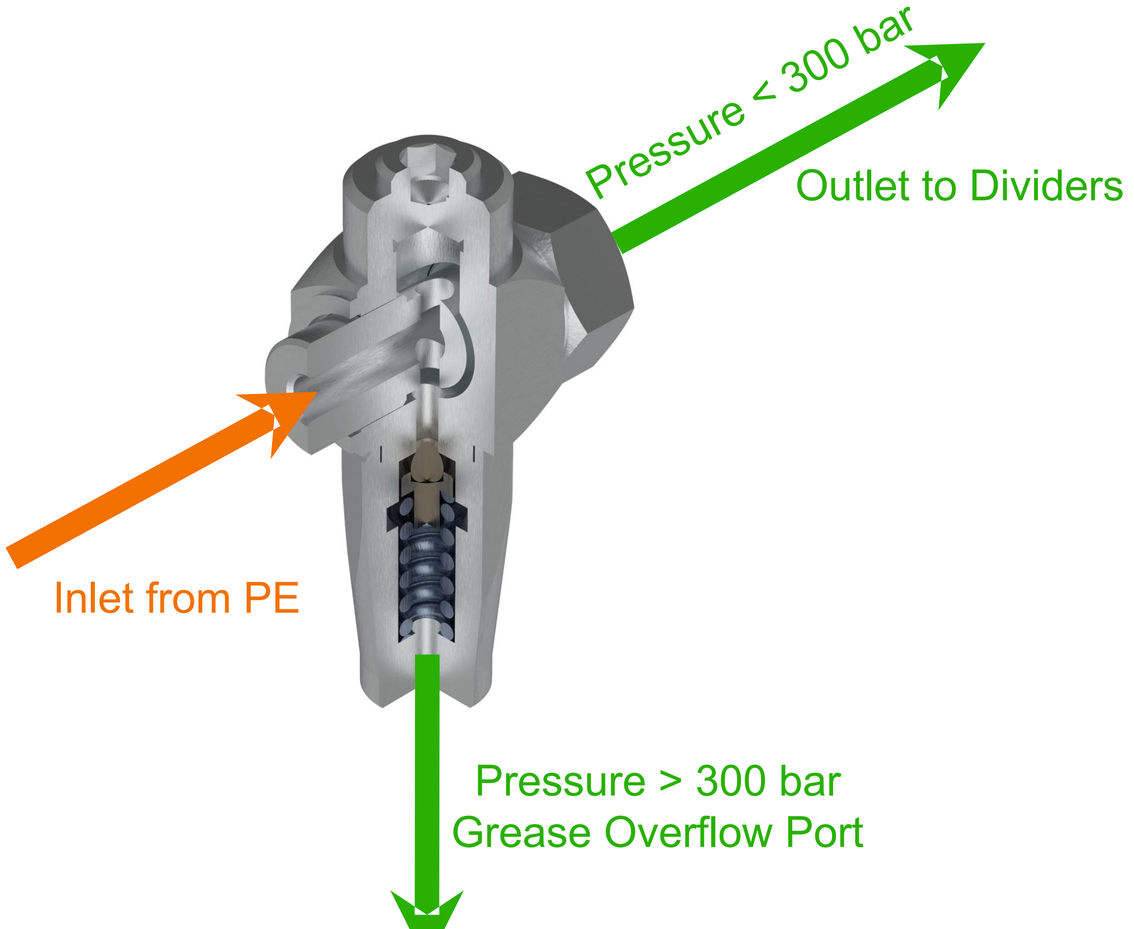
RV-C without bypass function
RV-C is preset to 300 bar

When the system pressure is higher than the pre-set Relief Pressure (300 bar), the Relief valve opens, lubricant flows from the relief valve overflow port out.

Please consider the relevant environmental conditions!

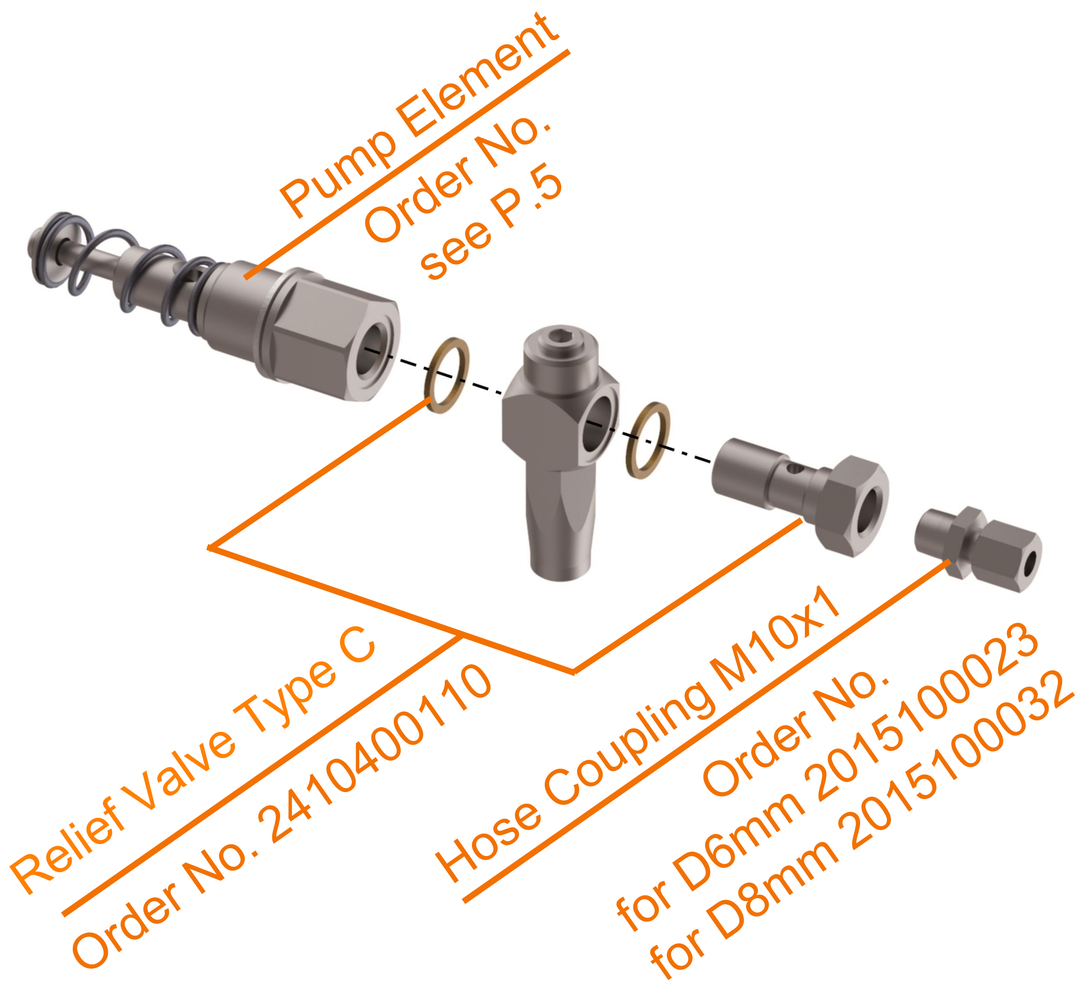
Order No. for Relief Valve -C

	Option	Order No.
RV-C*	/	2410400110
Straight Coupling*	D6mm	2015100023
	D8mm	2015100032
Copper Ring	/	2430200220

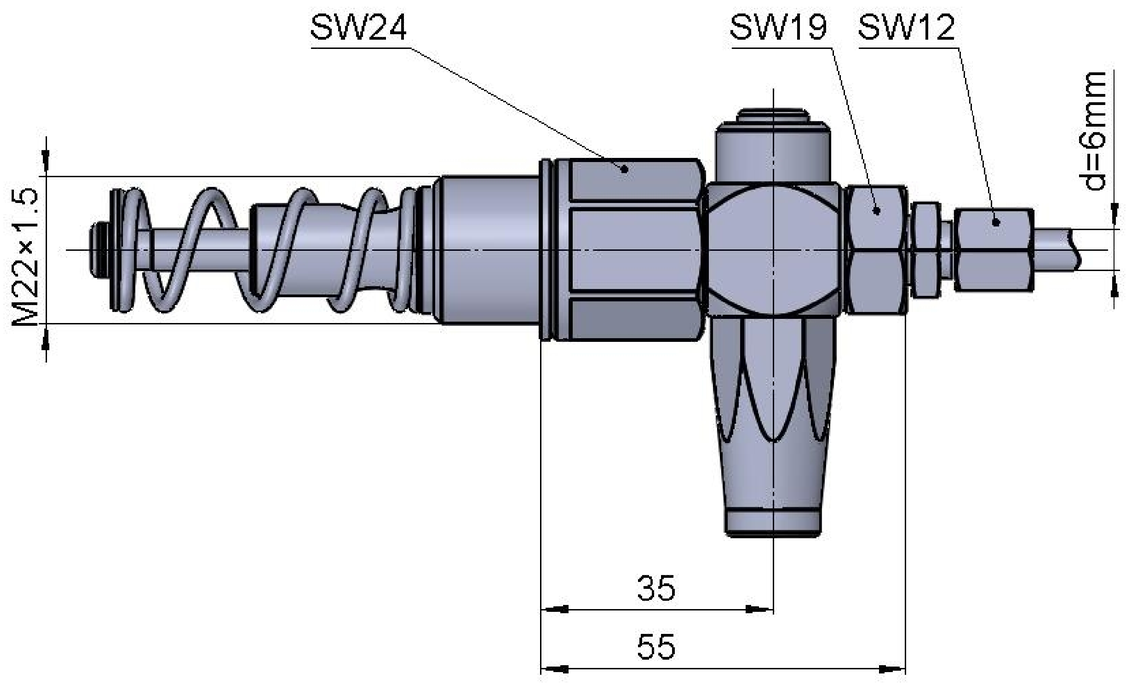


Dia. 8.1 Relief Valve C working principle

** For RV-C Order No. 2410400110 already includes the copper rings. For extra Copper Ring Order No. is 2430200220.*

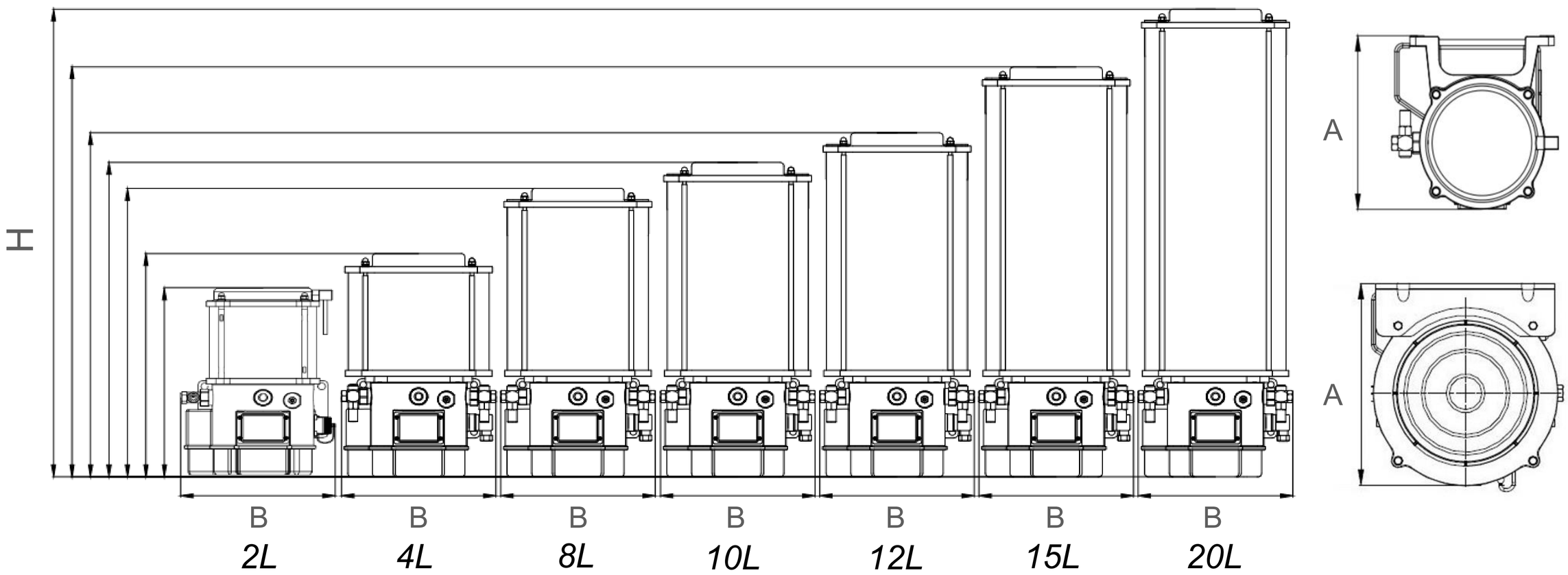


Dia. 8.2 Explosion for RV-C with PE + Straight Coupling



Dia. 8.3 Installation Dimensions for RV-C + PE

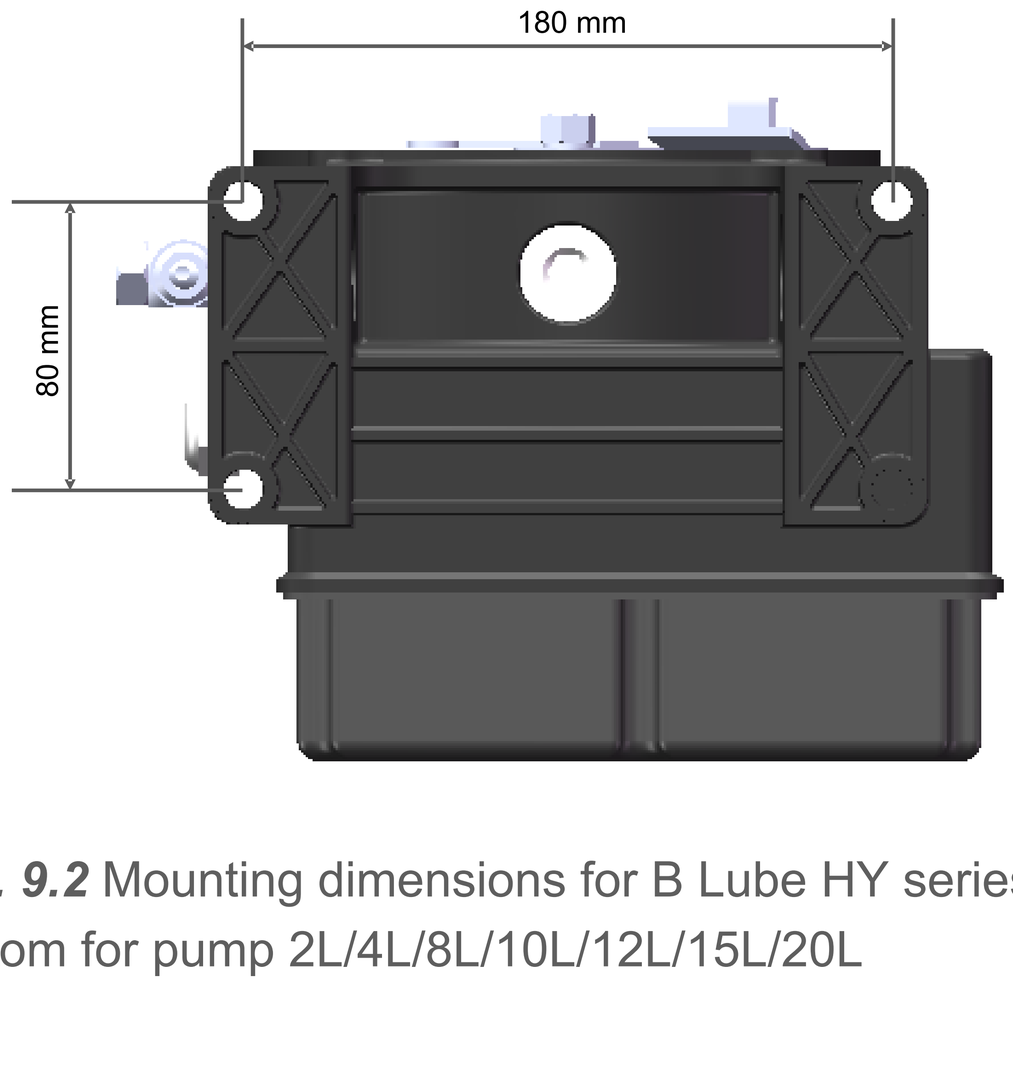
Installation Dimensions



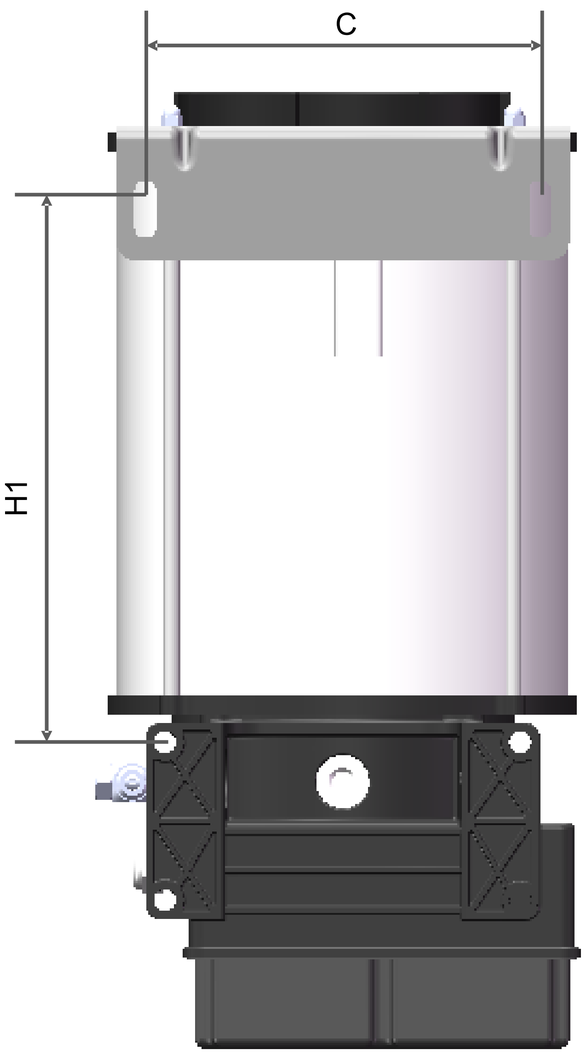
Dia. 9.1 Installation dimensions for B Lube HY series pump

Installation Dimensions for B Lube HY Series Pump

Capacity	2L	5L	8L	10L	12L	15L	20L
A (mm)	228	260	260	260	260	260	260
B (mm)	236	251	251	251	251	251	251
H (mm)	326	379	479	530	581	689	789



Dia. 9.2 Mounting dimensions for B Lube HY series Pump Bottom for pump 2L/4L/8L/10L/12L/15L/20L



Dia. 9.3 *Dimensions for B Lube HY series Pump Top for pump 8L/10L/12L/15L/20L*

Dimensions for B Lube HY series Pump

Capacity	8L	10L	12L	15L	20L
H1 (mm)	265	315	367	475	575
C (mm)	200	200	200	200	200

Low-level Indication

Functioning principle of the intermittent low-level indication

The intermittent low-level indication operates of contact, Its main components are the following:

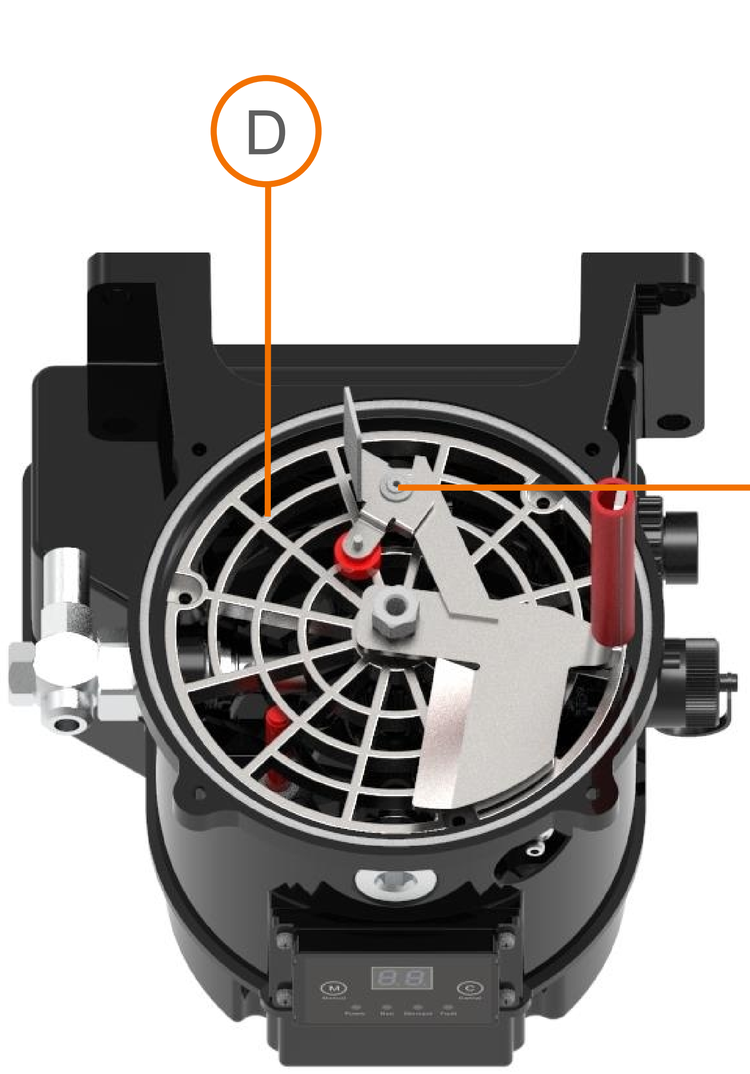
1. firmly positioned magnetic switch “C” inside of the reservoir bottom

2. flexible guide plate “B” connected to the stirring paddle with a magnet “A” and a control curved track “D”.

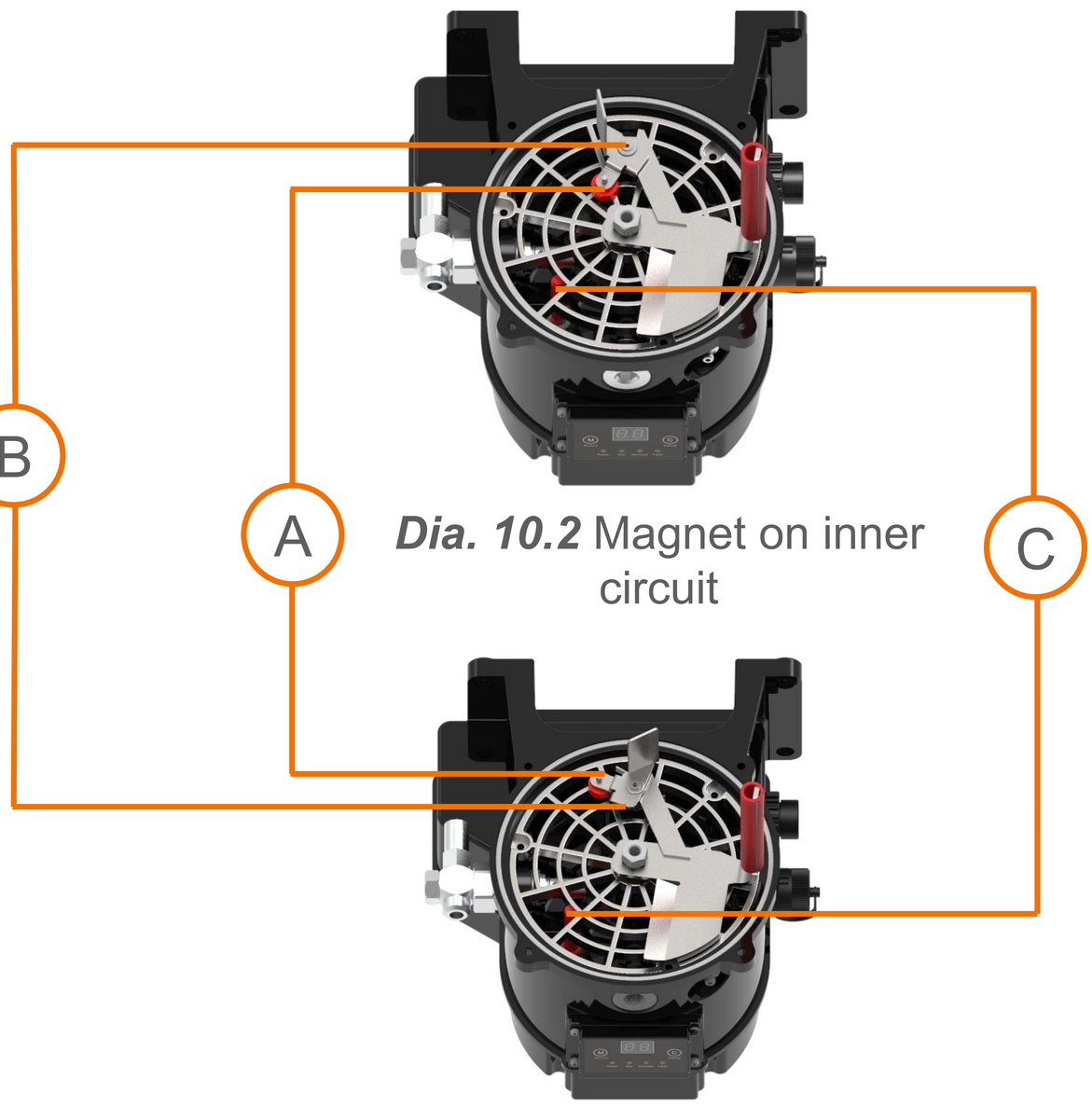
If the reservoir is filled with a lubrication grease suitable for the intermittent low-level indication, and the pump is operating, then the guide plate “B” is deflected by the resistance of the lubrication grease.
As a consequence, the magnet “A” connected to the guide plate “B” is moved on the inner circuit and cannot trigger a pulse at the magnetic switch “C” with its magnetic field.

A control curved track “D” positively guides the magnet together with the pivoted guide plate towards the outside during each revolution.
As soon as the guide plate leaves the control curved track,the lubricant’s resistance pushes the guide plate together with the magnet to the inside again.

As soon as the lubricant inside the reservoir has fallen to the level of insufficient resistance to further deflect the guide plate “B” ,the magnet “A” remains on the outer circuit and triggers a pulse each time it slides a cross the magnetic switch “A”. If during an operating cycle the magnet “A” slides across the magnetic switch “C” six times, a low-level signal is sent by the control printed circuit board of the pump. For programming of the external control of the pump, see corresponding chapter in these instructions (**REF. Page 12**).



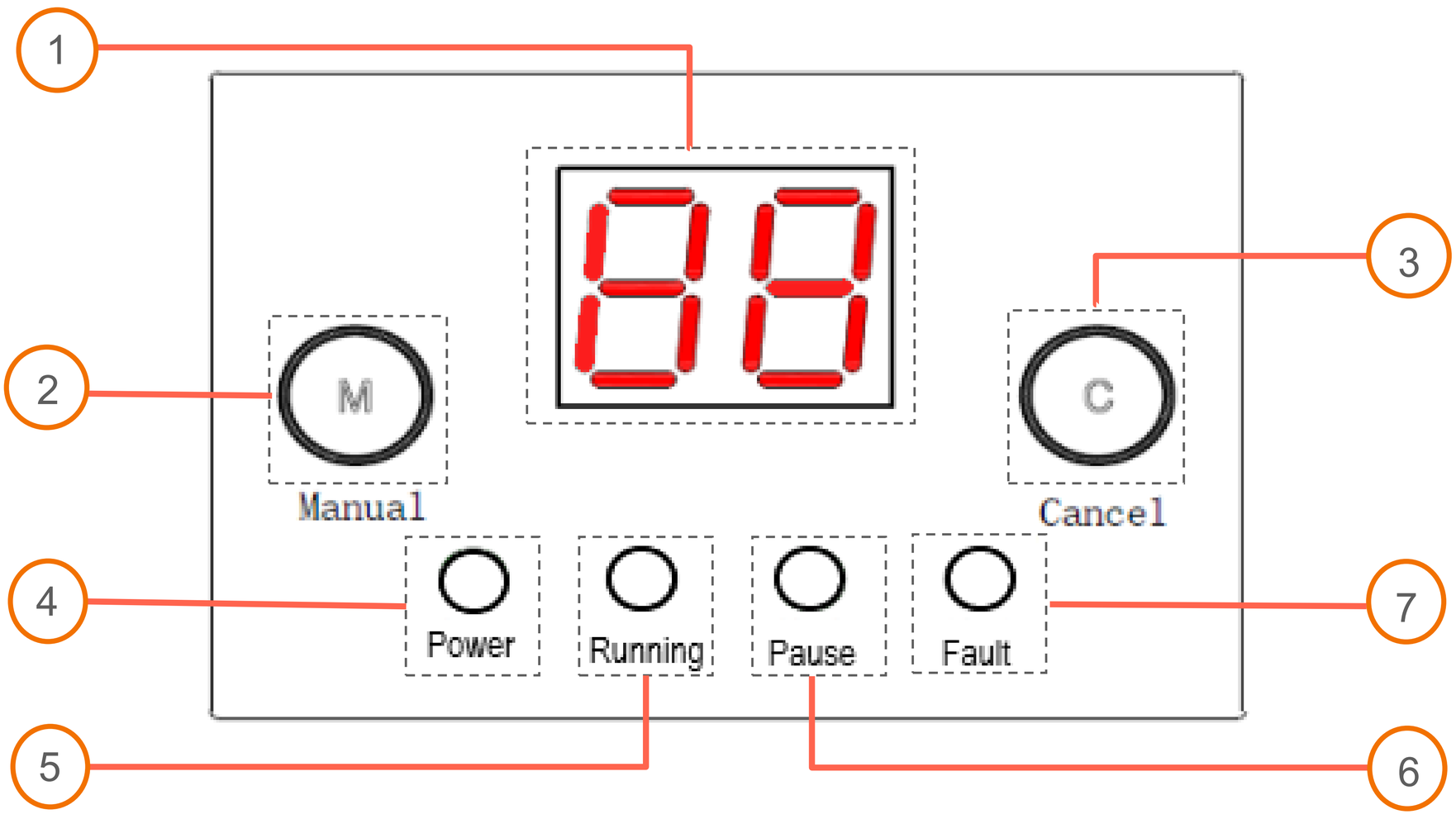
Dia. 10.1 Low-level Indication - Perspective representation



Dia. 10.2 Magnet on inner circuit

Dia. 10.3 Magnet on outer circuit

Integrated Controller



Dia. 11.1 Controller interface

Pump controller is the integrated controller for HY series pump.
and LED indicator and functional keys area (***Dia. 11.1***).

LED display: shows system status like the data of lubrication system ①,
Error Code:
E1 The power is supplied on controller, but the motor does not run
E2 Motor short circuit
E3 The pump does not receive a signal from the divider monitoring after the end of work
E4 Low grease level or no grease in pump reservoir, pump is under risk of running empty

LED indicator: power lamp ④, lubrication lamp ⑤, pause time lamp ⑥, and warning lamp ⑦.
In normal operation light Indicates what mode the pump is currently in.
When in settings mode, light flashes to indicates what mode you are setting.
Functional keys area: (M) test button②, (C) stop button/warning alarm③
Allow you to enter into settings mode adjust the pump parameters,
Reset the lubrication cycle on/off,
C allows to clear the warning alarms.
Push “M” 5 seconds , the pump enter test model , the pump will run 60 minutes , you can push “C” to stop the pump anytime.

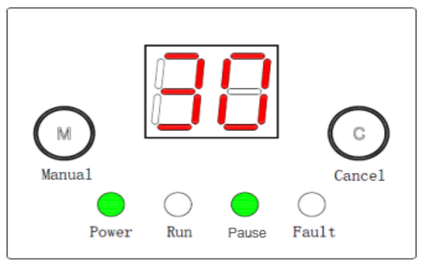
Key	Parameter Description
	Manual 1, Query parameter settings. 2, Parameter setting “+”:Every time you press it, the number +1. 3, Push it during the pause time, main display stops counting down pause time immediately and starts a new cycle with preset lube time.
	Cancel 1, Query parameter settings. 2, Parameter setting “+”:Every time you press it, the number +1. 3, Push it during the system warning or error alarm (E-1 , E-2) to clear the alarm, during the lube time, main display stops counting down lube time immediately and starts a new cycle with preset pause time.

Integrated Controller

Program Parameters - Set to run by time

For the first time connecting the power on the pump, the LED display shows (30), power lamp and pause lamp are green.

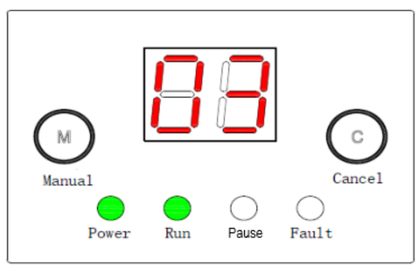
(***Dia. 12.1)*** The number 30 means the pause time.



Dia. 12.1 LED display and LED lamp/Pause time

Press both“C”and “M” for 2 seconds and release to enter settings mode.

The power lamp is green and Run lamp is flashing green. The LED display shows (03) the lube run time(***Dia.12.2***).
Example 03 means the lube time is 3 minutes.
Press “M”or“C”button to adjust the lube time value for minute.
**Numbers in lube time default to xx-minutes, the minimum value is 01 and the maximum value is 99.*



Dia. 12.2 “Lubricating time”

To save the set parameter Press“C”for 5 seconds and release.

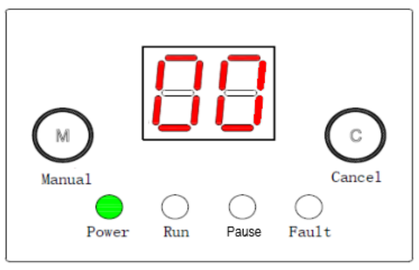
The Pause lamp is now flashing green and LED display shows (30) the pause time (***Dia.12.1***).
Example 30 means the pause time is 30 hours
Press “M”or “C” button to adjust the pause time value for hour.

**Numbers in pause time default to xx-hours, minimum value is 01 and the maximum value is 30.When the pause time is 1 hour ,the display shows 60 and* counts down in minute .

Press “C” 5 seconds and release.

Only the Power lamp is on and LED display shows (00) the signal type (***Dia. 12.3***).
Example 00 means the controller does not detect any signal

Press “M” or “C” button to adjust the value .



Dia. 12.3 Set “Signal type”

**For preset value of 00 -- does not detect any signal*
For preset value of 01 – detect the pressure signal only
For preset value of 02 – detect divider monitoring only
For preset value of 03 – detect the grease low level
For preset value of 04 – detect divider monitoring and grease low level
For preset value of 05 -- detect the pressure signal and grease low level
When the value set to 02 or 04 , there must be a divider signal input, otherwise a blocking signal will be reported.

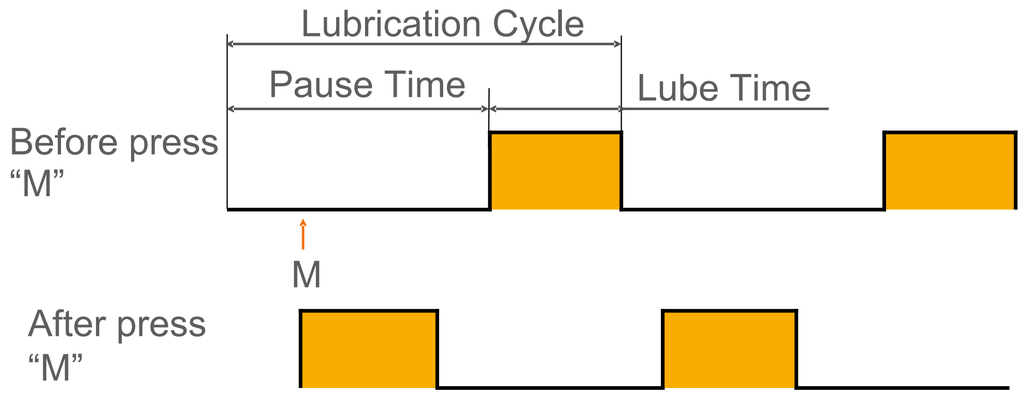
Push “C” 5 seconds and release to quit editing mode.

New parameter settings are done!

Integrated Controller

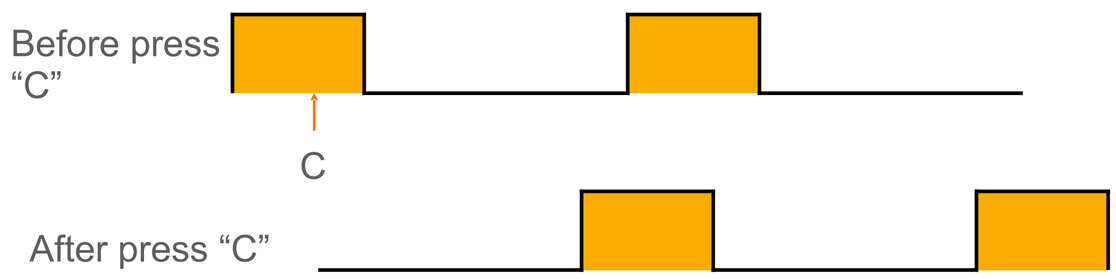
Run/Pause lubrication cycle

Press “M” key (manual button) during the pause time.
The pump will start a new lube cycle,
The main LED display and Green indicator lamp immediately switches from counting down Pause Time to counting down Lube Time / Run Time. (***Dia. 13.1***).



Dia. 13.1 Cycle no changing when press “M” during Pause time

Press “C” key during the Lube Time / Run Time ,
The pump will stop and enter Pause Time,
The main LED display and Green indicator lamp immediately switches from counting down Lube Time / Run Time to counting down Pause Time. (***Dia. 13.2***).

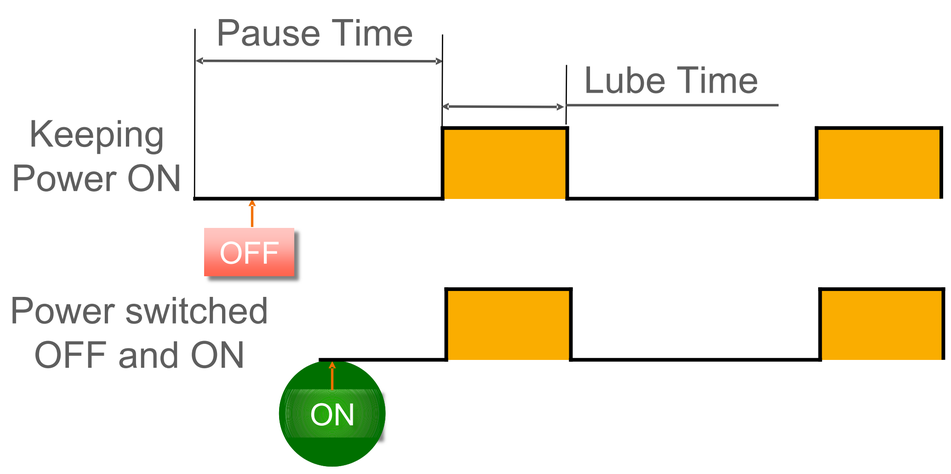


Dia. 13.2 Cycle changing when press “C” during Lube time

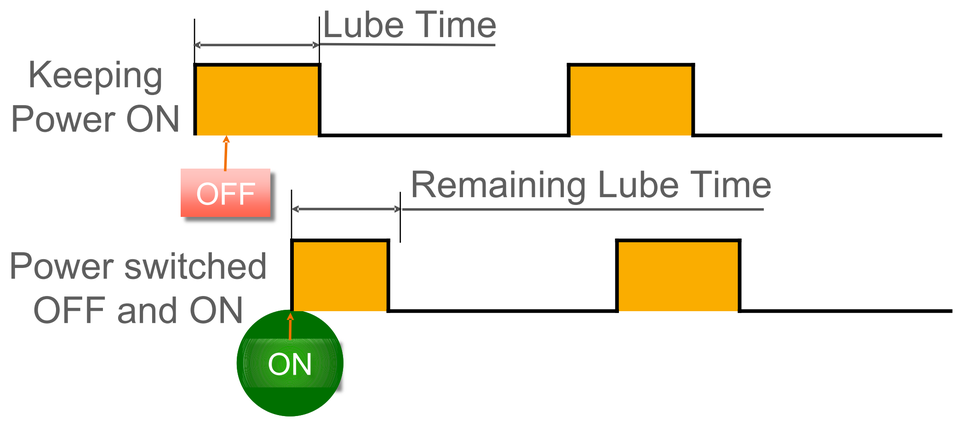
Restart of controller by switching off the machine

If the power / machine is turned off during a Lube Time or Pause Time, the cycle save and continue from where it left off when the power / machine is turned back on. (***Dia. 13.3 & 13.4***)

Example: Pump is in Lube cycle, it has 1 minute left on Run count down, power is immediately turned off during the cycle for 15 minutes.
After 15 minutes the power is switched back on, the pump will continue it 1 minute Lube/Run Time from where it left off.



Dia. 13.3 Cycle will not change when power switch ON and OFF during Pause time



Dia. 13.4 Cycle will not change when power switch ON and OFF during Lube time

Attention:
Press “M” key 5 seconds,
The controller enters the test running mode, and the lubrication pump runs continuously for 60 minutes.

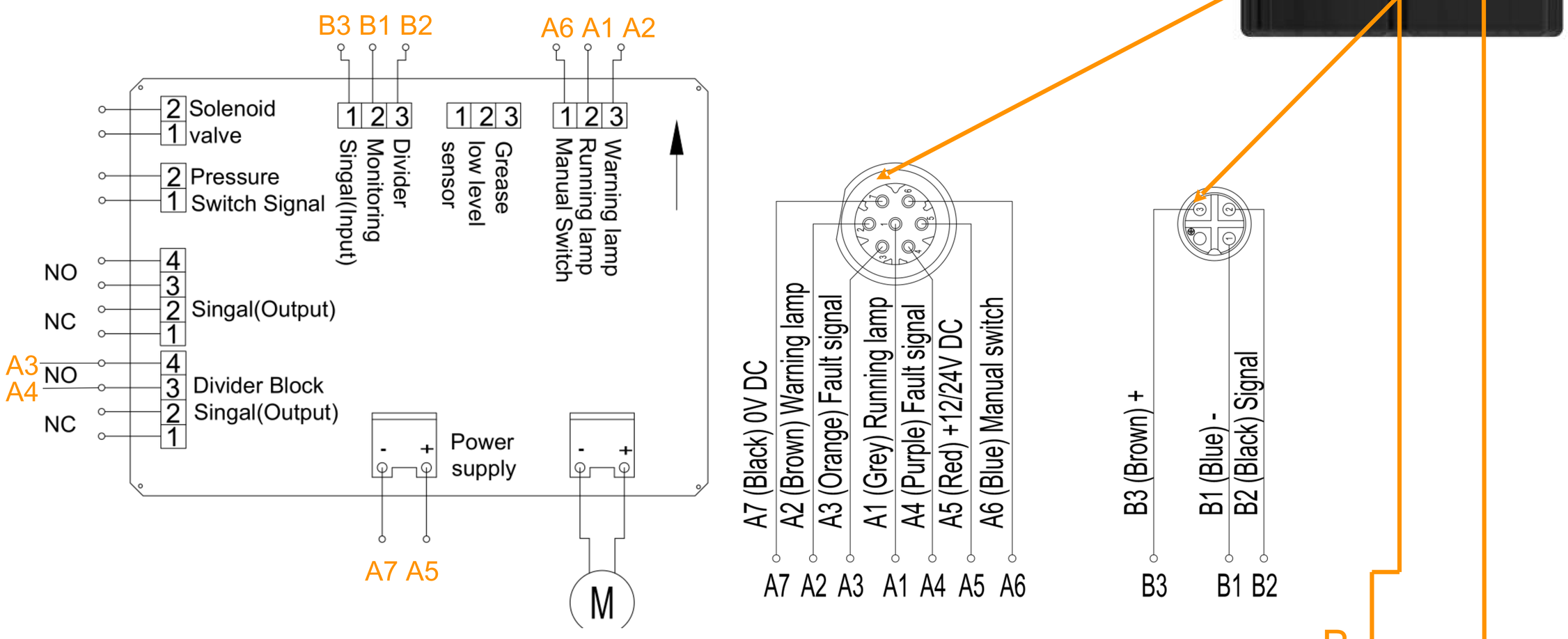
Press the“C” key to stop the lubrication pump at any time.

Wiring Connection

B Lube HY series Pump Wiring
Bayonet connector 7 Pin and Binder connector 3 Pin

The pump is supplied with 12V or 24V DC via
Bayonet connector 7-pin plug (**A**).
This connection is standard.
The distributor monitoring is connected to the pump (**B**).
(***Dia.14.1***)*.

** For more information about wiring and extras contact us.*



Order No. for Cables and relative Components*

Description	Order No.
10 meter - Power Cable Bayonet elbow connector 7/5 Pin - 12/24V DC	2422110012
7.5 meter - Power Cable Bayonet elbow connector 7/2 Pin - 12/24V DC	2422110013
5 meter - Divider Monitoring Cable Binder 3 Pin to AMP 3Pin	Please check our divider manual
Test Button + Indication Light Red & Green 12V DC	Contact us for switch options
Test Button + Indication Light Red & Green 24V DC	

Dia. 14.1 Wiring connection

Filling of the Pump

1. Lubricant: NLGI Grade.2, it is strongly recommend using the different special grease under the following temperature:

a) -10℃ ~ 70℃ , normal grease can be used,

b) -20℃ ~ -10℃, low temperature grease -30℃ ~ 120℃ is recommended,

c) -30℃ ~ -20℃, low temperature grease -40℃ ~ 120℃ is recommended.

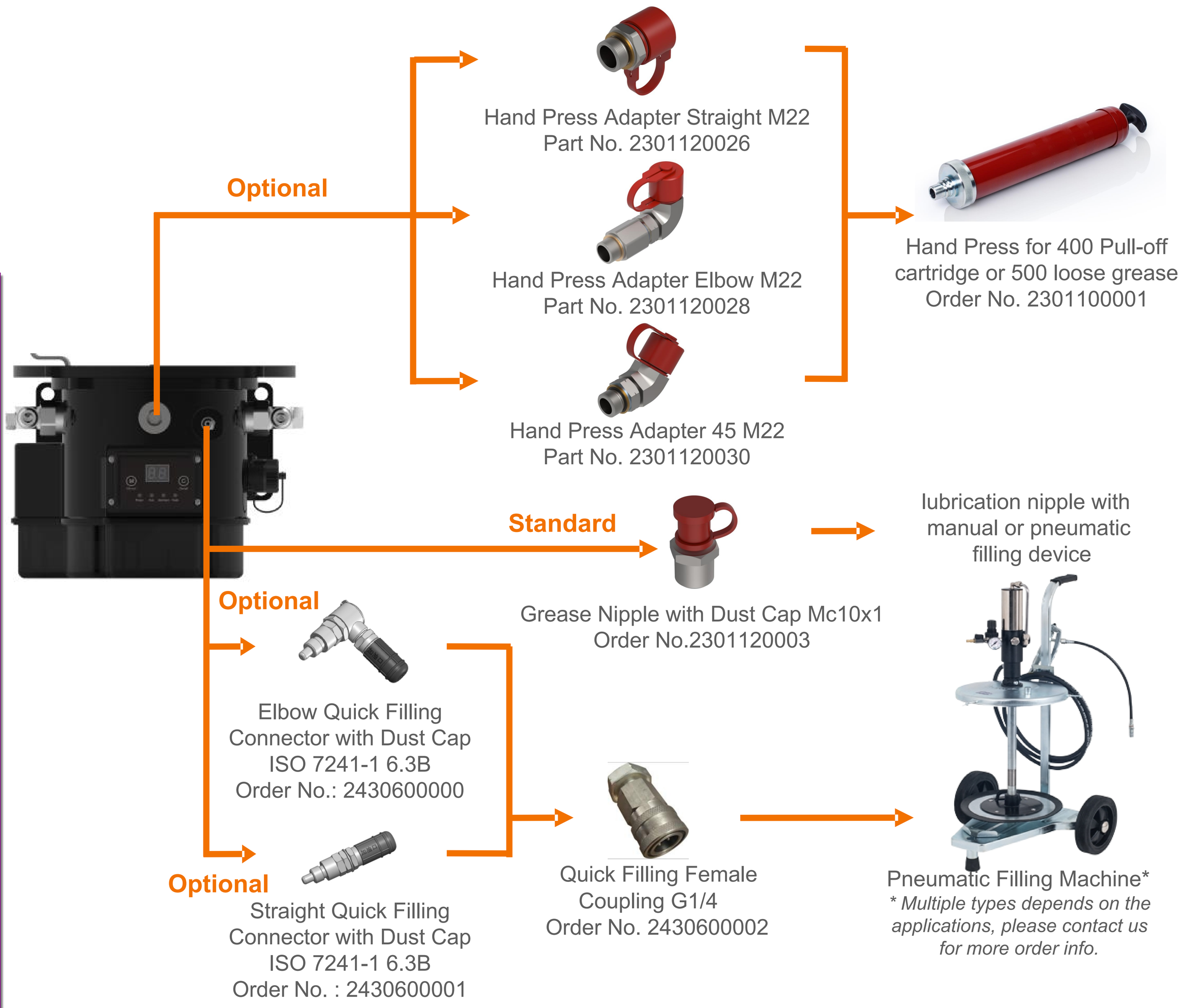
For advise on recommended grease for B Lube systems that best suites your needs please contact us.

2. Pump must be kept vertical at all times.

3. The refilled grease level can not be higher than the “Grease Level Max”. Keep watching the grease level when filling lubrication pump, stop before the grease level hits about 5-10mm lower than the “Grease Level Max” position.

4. It is strictly forbidden to remove the top cover of the pump for filling lubricants!

5. Only fill with clean lubricants! The service life of the pump elements and divider blocks highly depends on the quality of the used lubricants.



Dia. 15.1 Filling connector connection