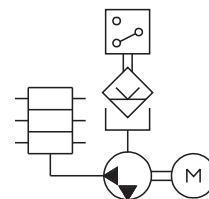




WOERNER
The Experts in Lubrication

**Pump unit
GMG-K**

**Patent no.:
EP1775467**



Use:

As a pump unit in central lubrication systems.

- for the delivery of oil, low-viscosity grease or grease
- 1 to 6 pump outlets
- availability of up to 60 outlets, when a progressive distributor is flanged on
- electric control and monitoring
- two lubrication circuit can be triggered separately



- Subject to modifications -

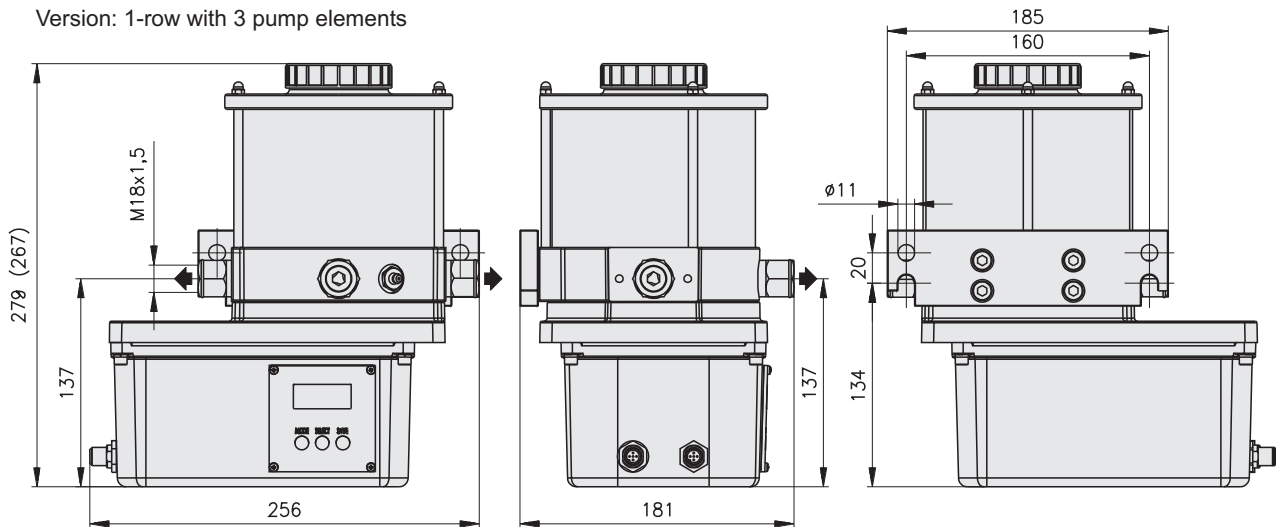
Pump unit GMG-K

EUGEN WOERNER GmbH & Co. KG
Postfach 1661 DE-97866 Wertheim
Hafenstrasse 2 DE-97877 Wertheim
Tel. +49 (0) 9342 803-0 info@woerner.de
Fax. +49 (0) 9342 803-202 www.woerner.de

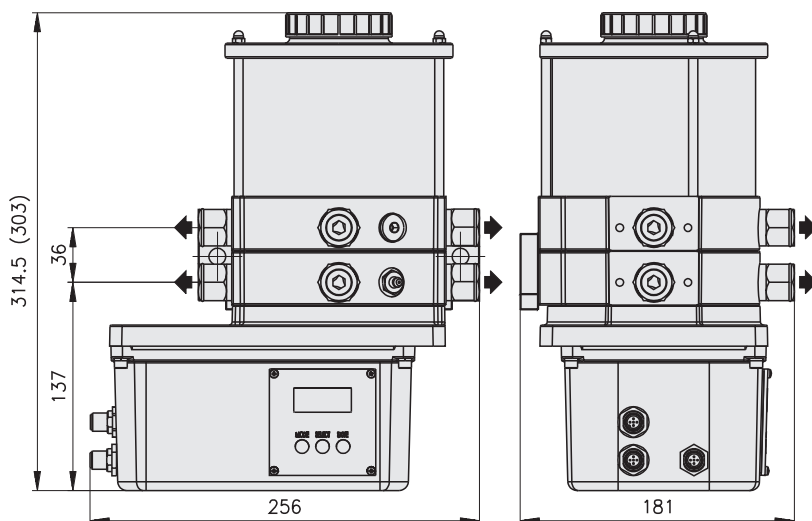
Leaflet-No. 0793.03.10 EN
Replaces No. 0793.11.09 EN
Page 1 of 14



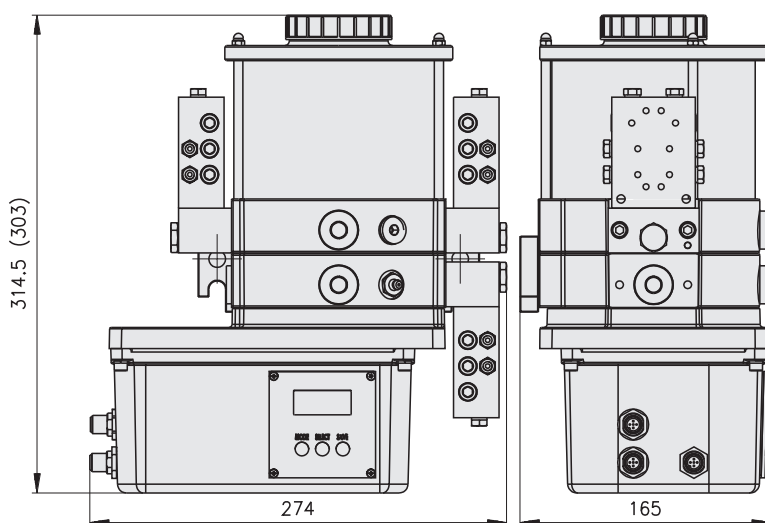
Version: 1-row with 3 pump elements



Version: 2-row with 6 pump elements



Version: 2-row with 3 progressive distributors type VPB-G



Technical data:

Delivery pressure: 250 bar at max.

Number of pump elements: 6 at max.

Delivery volume per stroke and element
with pump element 04: 0,04 cm³
with pump element 08: 0,08 cm³
with pump element 16: 0,16 cm³

Temperature range: Oil: -20 ... +60 °C
Grease: 0 ... +60 °C

In the presence of low temperatures,
grease penetration should be observed.

Installation position: vertically

Material

Casing: aluminium
Pump element: steel
Reservoir: Al / PP / Acryl
Gaskets: NBR / FPM

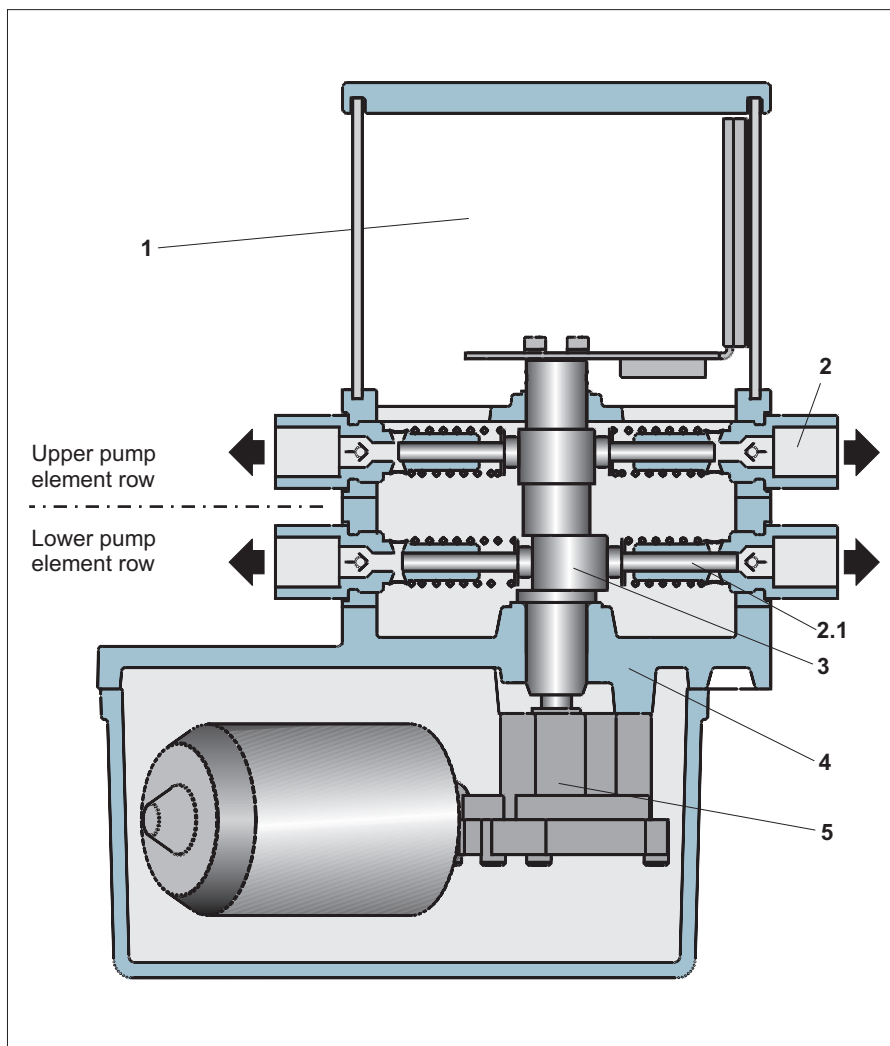
Medium: Mineraloil and grease up to
NLGI-class 2
(Be careful to observe deviating usage
conditions of reservoir and level moni-
toring!)

Drive:

Connected load: 24 VDC
Current: 2,5 A
Speed(load-dependent): approx. 30 min⁻¹
Type of protection: IP 55
(Depending on type, the direct current
gear motor may be operated in pulse
mode only. In different modes, three-
phase current motors are of advantage,
e.g. the GMAC-C pump unit.)

() Dimensions without filler cap

- Subject to modifications -



Description:

Drive:

The GMG-K pump unit is driven by a gear motor **5** that is flanged to the pump casing **4** from bottom.

Delivery function:

When the eccentric shaft **3** is rotating, the pump element's delivery piston **2.1** performs both a suction and delivery stroke per rotation each, thus delivering lubricant from the reservoir **1** to the lubrication points. Depending on the case of application (lubricant, lubricant requirement, etc.), the pump unit can be fitted with different pump elements, reservoirs, and monitoring elements.

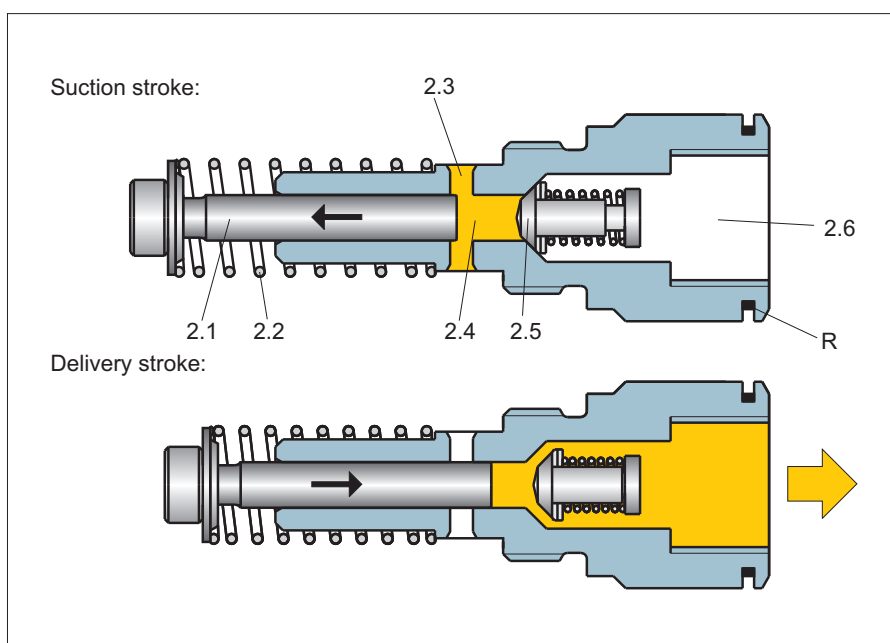
Delivery function separated between upper and lower pump element rows:

If the eccentric shaft **3** rotates into the left direction of rotation¹⁾, the pump elements of the lower row will deliver while those of the upper row are idle.

If, however, the eccentric shaft **3** rotates into the right direction of rotation¹⁾, the pump elements of the upper row will deliver while those of the lower row are idle.

The integrated control module can be used to program the operating and idle periods for the separated delivery by both the lower and upper row.

¹⁾ When viewed from the reservoir.



Pump elements:

In **suction stroke**, the pressure spring **2.2** moves the delivery piston **2.1** towards the eccentric shaft **3**. During such move, the lubricant available in reservoir **1** is drawn through the suction bore **2.3** into the metering chamber **2.4**.

In **delivery stroke**, the eccentric shaft **3** displaces the delivery piston **2.1**. As a result, the suction bore **2.3** is closed and the lubricant volume available in the metering chamber **2.4** delivered to outlet **2.6** through the check valve **2.5**.

The 0,16 cm³ delivery volume pump element is marked with a black ring **R**.

Marking the pump elements:

Size:	Delivery volume:	Marking R :
04	0,04 cm ³	white ring
08	0,08 cm ³	without ring
16	0,16 cm ³	black ring

Notes on operation:

The pump unit must be operated with clean oil or grease from original packagings only. When filled initially, the pump needs to be filled with gear oil up to the agitator blade for start-up. As a result, proper venting will be ensured. The lines to the lubrication points

must be cleaned and have free throughput. Do not connect them to the lubrication points unless the lubricant comes out free of air inclusions. All delivery line connections should be checked for leakage.

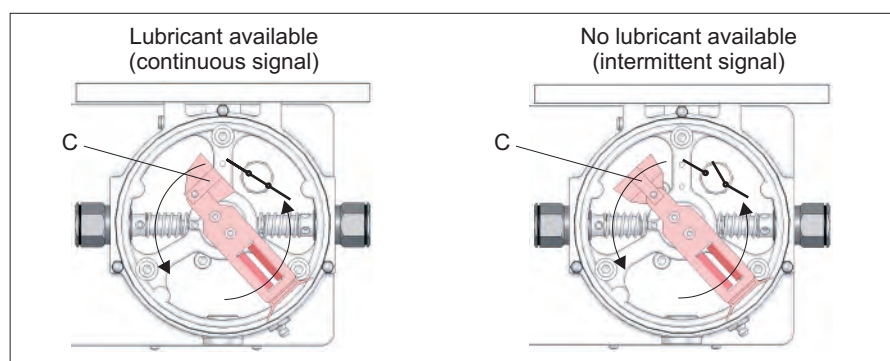
In order to protect the pump unit and the connected lines from overload, it is essential to install protective elements, e.g. pressure control valves.

Level monitoring:

Level monitoring "C": minimum level monitoring for grease

When the reservoir is empty and the pump drive shaft rotating, an intermittent signal will be released.

The switching mechanism may be subjected to shifting, e.g. during reservoir filling. In case of external control, signal evaluation must therefore be delayed (approx. 5 seconds) upon pump switch-on and change of direction of rotation.

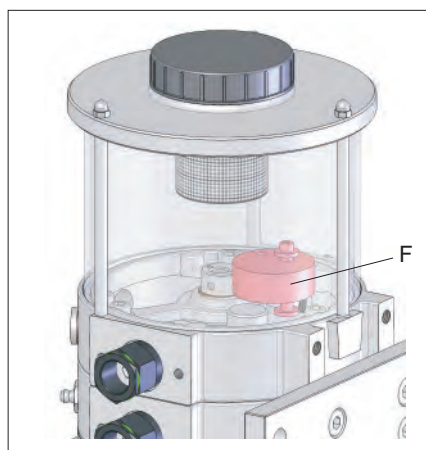


Level monitoring "F": minimum level monitoring for oil

The level monitoring device "F" comprises a PUR float that is lifted in the oil. Should the level fall below the minimum oil filling level, the contact will open.

Note:

The PUR float is suited for mineral oils only. When using different media, their compatibility needs to be checked first.



Technical data:

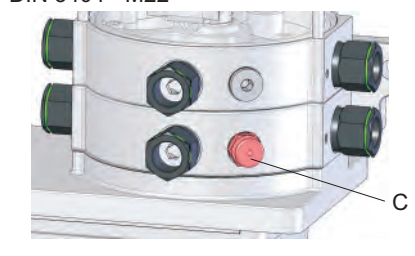
Temperature range:	-20 ... +60 °C
Supply voltage:	24 VDC
Switching current at max.:	80 mA
Switching power at max.:	1,5 W
Contact function:	PNP opener

Filling connector:

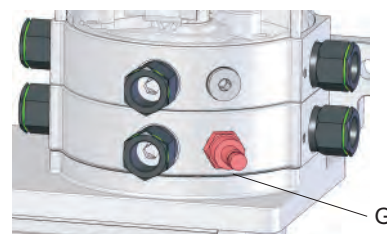
Filling connector "A"
Hydraulic-type lubricating nipple
DIN 71412 - AG1/4



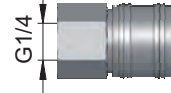
Filling connector "C"
Button head lubricating nipple
DIN 3404 - M22



Filling connector "G"
Closing nipple



Auxiliary for filling connector "G":
Coupling
954.002-09
(p_{max} = 35 bar)



- Subject to modifications -



Flanged progressive distributor:



At the pump elements, VPB progressive distributors can be flanged on directly. It is possible to fit 3 progressive distributors having up to 20 points each and different allocation volumes.

The following progressive distributors can be flanged on directly:

VPB-B	Leaflet-No. P0378
VPB-G	Leaflet-No. P0177

Checking progressive distributor function:

If the progressive distributor is to be monitored by means of the internal control unit, then the functional control RS at the progressive distributor needs to be selected either.

(For the connecting cable required see "Auxiliaries" on last page.)

Note: When using the pump control unit, only one distributor per pump element row can be monitored.

Note on operation:

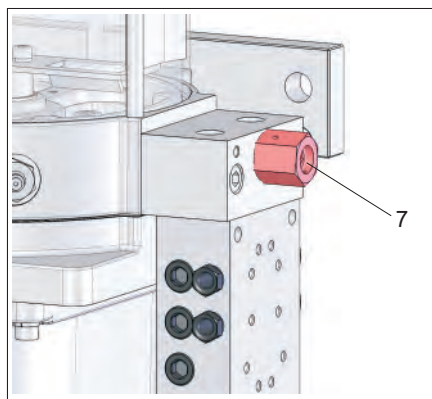
On start-up, the pump elements and progressive distributors need to be vented. The lubricant must come out from all distributor outlets free of any air.

First, the connection casing at the venting screw 6 or at the installed pressure control valve has to be vented, and then the progressive distributor.

Note:

The 0,16cm³ delivery volume pump element is marked with a grey plastic burl N.

For more information see
Operating instructions no. B0776



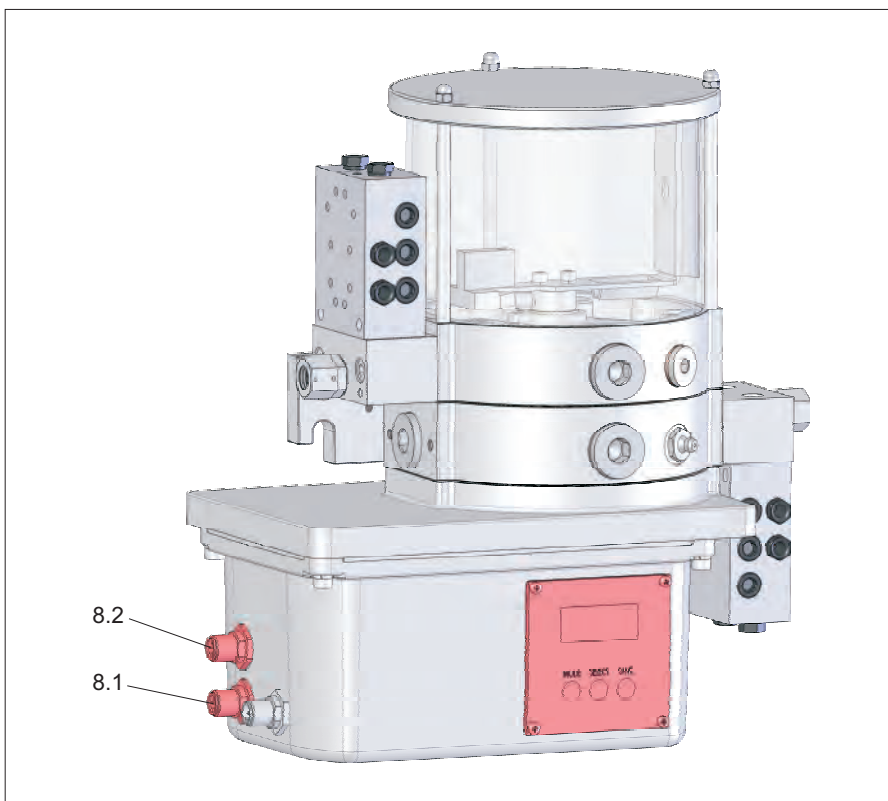
Auxiliaries:

Pressure control valve at the progressive distributor:

To limit the maximum operating pressure, a pressure control valve 7 can be screwed in instead of venting screw 6.

(For the pressure control valves required see "Auxiliaries" on last page.)

Control unit:



The control unit serves to monitor and trigger the pump unit. It is capable of switching the pump on and off depending on both time and load. Besides, the control unit can monitor the filling level as well as the function of the progressive distributors. In case of fault, a corresponding message can be made accessible to a superior system. The control unit must be started via an external "release".

Control version "C":

Without connectors 8.1 and 8.2 for distributor monitoring

Control version "C2":

With connectors 8.1 and 8.2 for distributor monitoring

Technical data:

Power consumption:	1,7 W
Supply voltage/target:	24 VDC
Supply voltage:	18V-30VDC
Voltage, inputs:	24 VDC
Response time, inputs:	200 ms
Input resistance:	4 kR
Temperature range:	-20 °C ... +60 °C
Output, alarm:	100 mA / 24 VDC / 2 W
Data buffer:	10 years

- Subject to modifications -

Control unit operation:

1. Menu call-up:

By keeping the "MODE"-key depressed for a while, the menu structure will be called up.

2. Navigation within the menu:

By keeping the "MODE"-key depressed another time, the menu items P1 ... P11 (P19)* can be selected successively.

3. Changing of values:

The "SELECT"-key can be used to change set values and functions. In case of time data, short pressing of the "SELECT"-key results in an adjustment by +1, whereas any longer pressing will result in an adjustment by +20. When the "SAVE"-key is depressed for a while, set values will be saved. Pressing the "MODE"-key enables the next menu item to be accessed without any saving action.

4. Special functions:

Additional dispense

When the "SELECT"-key is depressed in the operating mode "ON" for a while, pumping operation will be carried out for 60 seconds.

5. Test Mode:

By pressing the keys "SAVE" and "MODE" quickly in one go and in the order mentioned, a pump test mode will be invoked (the keys have to be kept depressed for 0.5 seconds at least).

In this mode, a pumping process will be actuated for 10 seconds. Thereafter, the pump continues to stir for another 5 seconds.

6. Change of password starting from software version 2.52:

1. Press "Save" + "Select" + "Mode"
2. Keep keys depressed and switch voltage on
3. Enter current password (factory default: 1234)
4. Save by pressing "Save"
5. Enter new password
6. Save by pressing "Save"
7. The program will change into normal mode

If the newly changed password gets lost, the control unit can be reset to the original parameters in the factory.

This, however, will result in loosening all changes made.

For that reason, all changes made to the parameters should always be recorded and archived.

Fault description:

- E1 = Motor overloaded
- E2 = Progressive distributor lower pump element row fault
- E3 = Level fault
- E4 = Progressive distributor upper pump element row fault*

Fault messages can be deleted by keeping the "SAVE"-key depressed for a while

*) Applicable to the version with two pump element rows only.



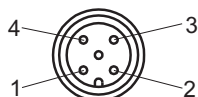
Electrical connection:

Version with control unit:

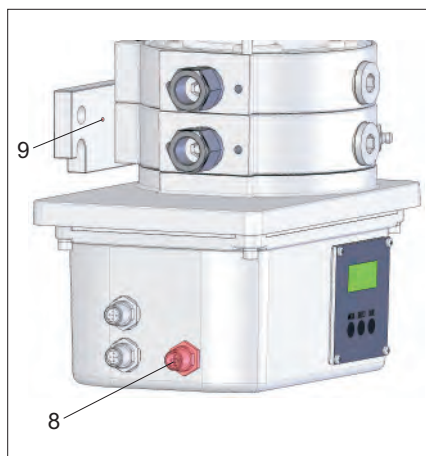
Electrical connection 8:

Connection type:

5-pin connector socket (M12)



- 1- +24 VDC
- 2- +24 VDC (external release)
- 3- 0 V
- 4- Alarm output



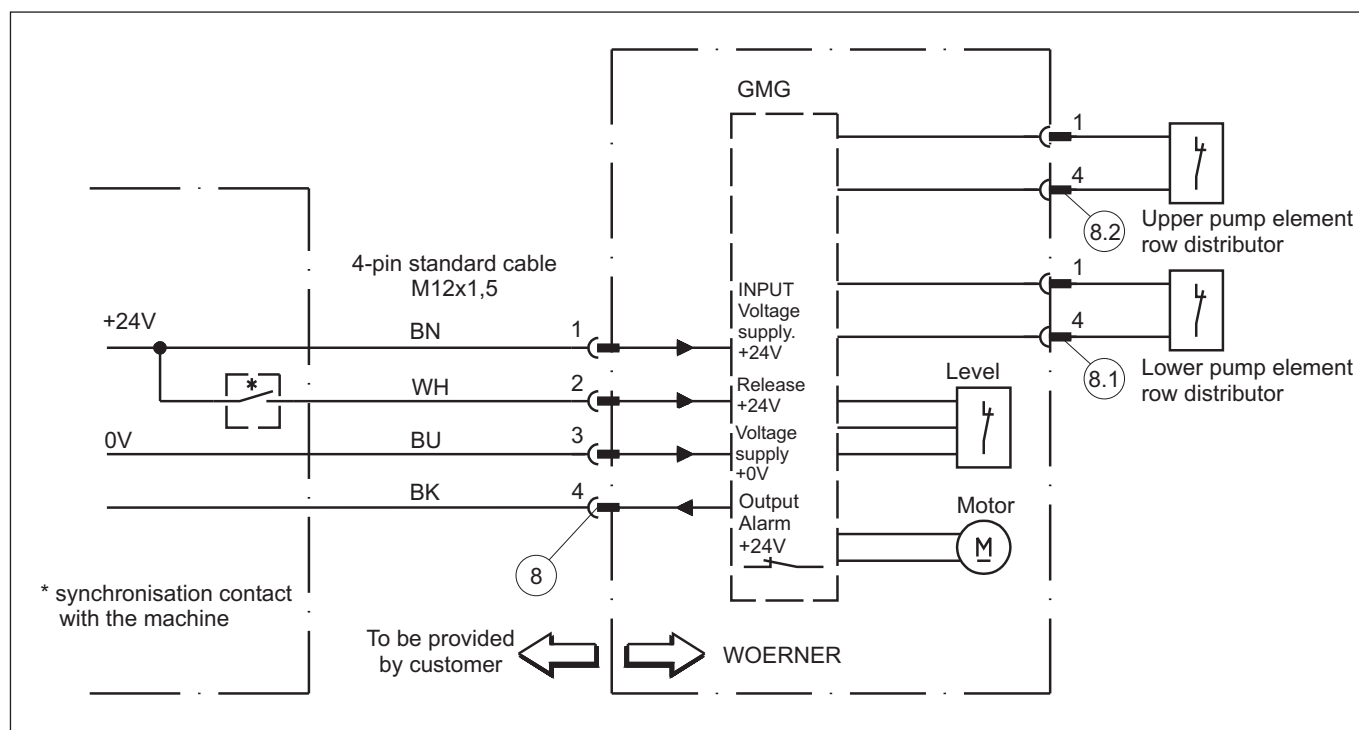
Equipotential bonding 9:

Threaded bore:

M4

(For the connecting cables required see "Auxiliaries" on last page.)

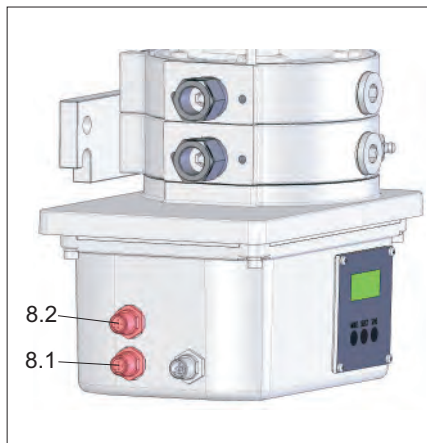
Connection diagram pertaining to control "C2" for 2 rows



For pump operation, voltage supply must be available. In case of Time ON, it is also necessary to apply +24V to the operation of PIN 2. Time will elapse only then. In case of pulse operation, the machine pulses have to be applied to PIN 2.

Connection for progressive distributors to the control unit "C2":

- 8.1** Connection socket for the lower pump element row
- 8.2** Connection socket for the upper pump element row



Note:

Due to the control mechanism, one progressive distributor per pump element row can be monitored only.

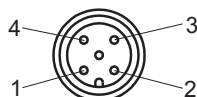
(For the connecting cable required see "Auxiliaries" on last page.)

Version without control unit:

Motor connection 8:

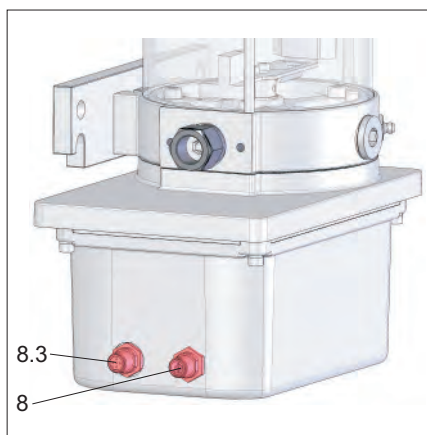
Connection type:

5-pin connector socket (M12):



- 1- +24 VDC (0V)¹⁾
- 2-
- 3- 0V (+24 VDC)¹⁾
- 4-

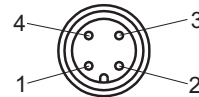
¹⁾ depending on direction of rotation



Level connection 8.3:

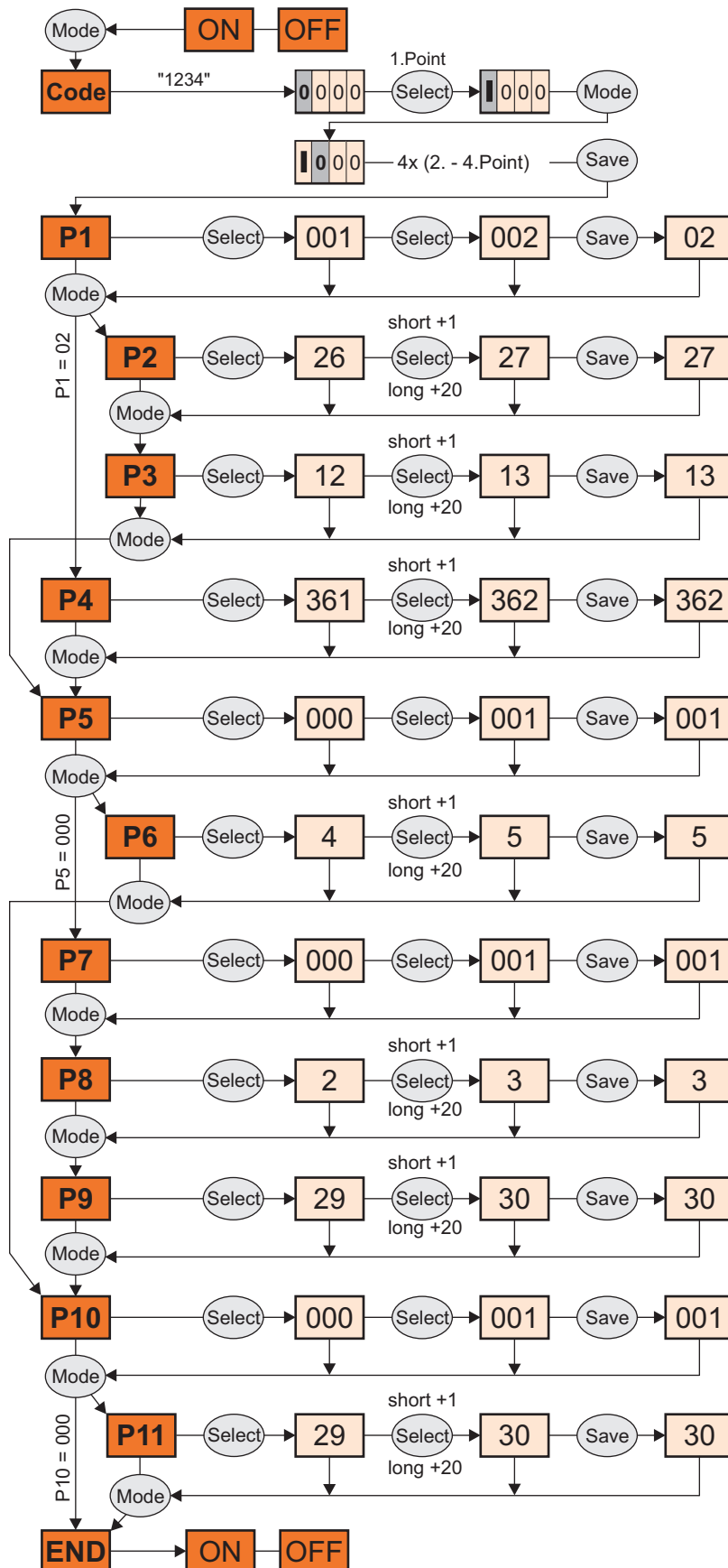
Connection type:

4-pin connector socket (M12):



- 1- +24 VDC
- 2-
- 3- 0V
- 4- Level (opener)

(For the connecting cables required see "Auxiliaries" on last page.)



Menu tree: Control with one pump element row

Keyboard release:
"1234" unlocks the keyboard

P1: Time mode/pulse mode:
Selection between time mode 01 and pulse mode 02
Default: 01

P2: Cycle time¹⁾ h:
Cycle time setting in hours (0-255) Only for P1 = time mode
Default: 0

P3: Cycle time¹⁾ min:
Cycle time setting in minutes (1-59) Only for P1 = time mode
Default: 2

P4: Pulses:
Pulse setting (1-9999) Only for P1 = pulse mode
Default: 5

P5: Distributor pulse:
Stops pumping action acc. to preset pulse number 001 = ON, 000 = OF
Default: 000

P6: Distributor pulse number:
Distributor pulse setting (1-999) Only for P5 = Distributor pulse 001
Default: -

P7: Distributor monitoring:
Fault message release after 4 minutes without distributor signal 001 = ON, 000 = OFF
Default: 000

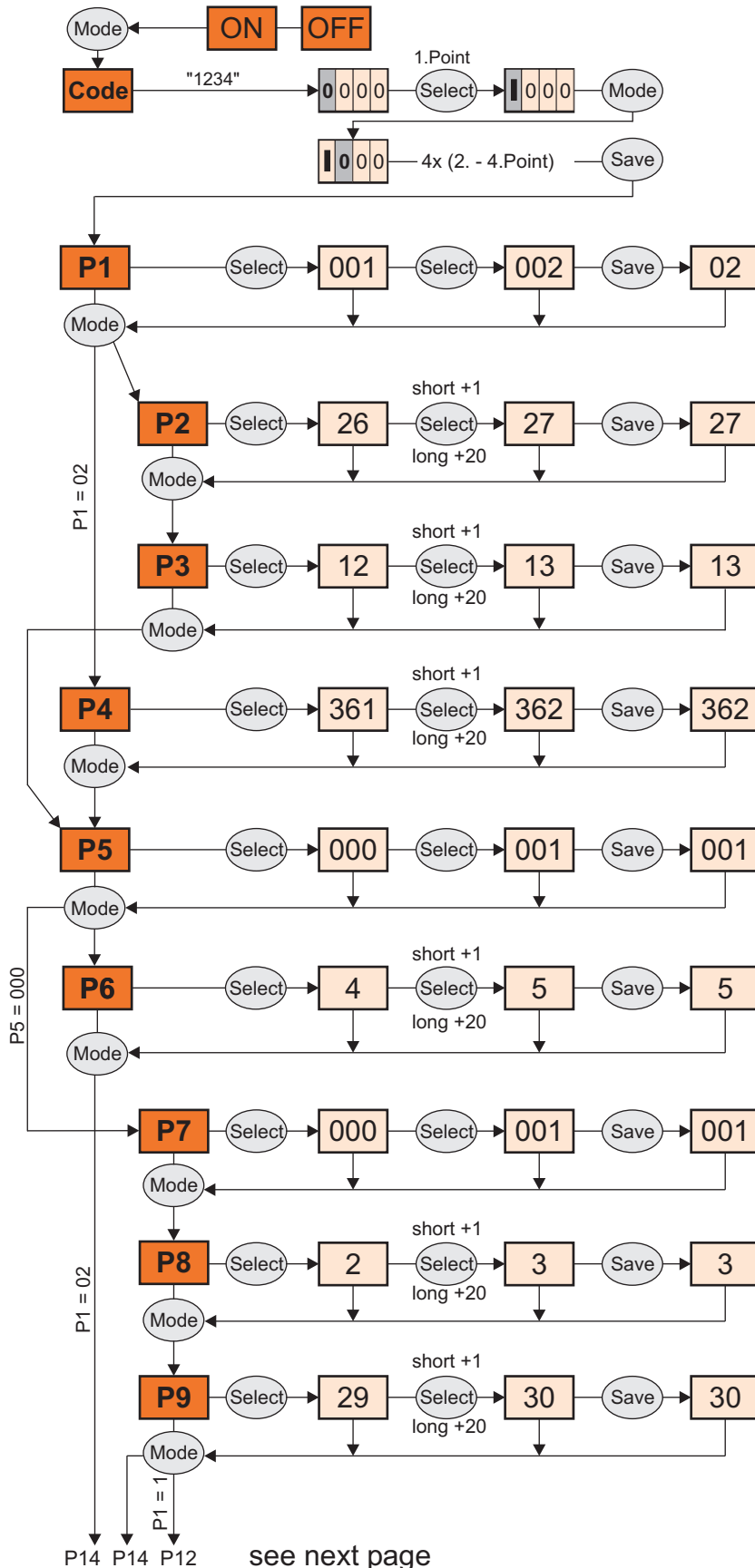
P8: Delivery time h:
Delivery time setting in hours (0-100) Only for P5 = distributor pulse 000
Default: 0

P9: Delivery time min.:
Delivery time setting in minutes (1-59) Only for P5 = distributor pulse 000
Default: 1

P10: Agitation:
Selection between "Agitation ON" = 001 and "Agitation OFF" = 000 (agitating time: 1min.)
Default: 000

P11: Idle time for agitation:
Idle time setting in hours (1-100) Only for P10=Agitation 001
Default: 1

¹⁾ Cycle time = delivery time + idle time



Menu tree: Control with two pump element rows

Keyboard release:
 "1234" unlocks the keyboard

P1: Time mode/ pulse mode:
 Selection between time mode 01 and pulse mode 02
 Default: 01

P2: Lower row cycle time¹⁾²⁾ h:
 Cycle time setting in hours (0-255) Only for P1 = time mode
 Default: 0

P3: Lower row cycle time¹⁾²⁾ min:
 Cycle time setting in minutes (1-59) Only for P1 = time mode
 Default: 2

P4: Lower row pulses:
 Pulse setting (1-999) Only for P1 = pulse mode
 Default: 5

P5: Lower row distributor pulse:
 Stops pumping action acc. to preset pulse number 001 = ON, 000 = OFF
 Default: 000

P6: Lower row distributor pulse number:
 Distributor pulse setting (1-100) For P5 only = Distributor pulse 001
 Default: -

P7: Lower row distributor monitoring:
 Fault message release after 4 minutes without distributor signal 001 = ON, 000 = OFF
 Default: 000

P8: Lower row delivery time²⁾ h:
 Delivery time setting in hours (0-100) Only for P5 = distributor pulse 000
 Default: 0

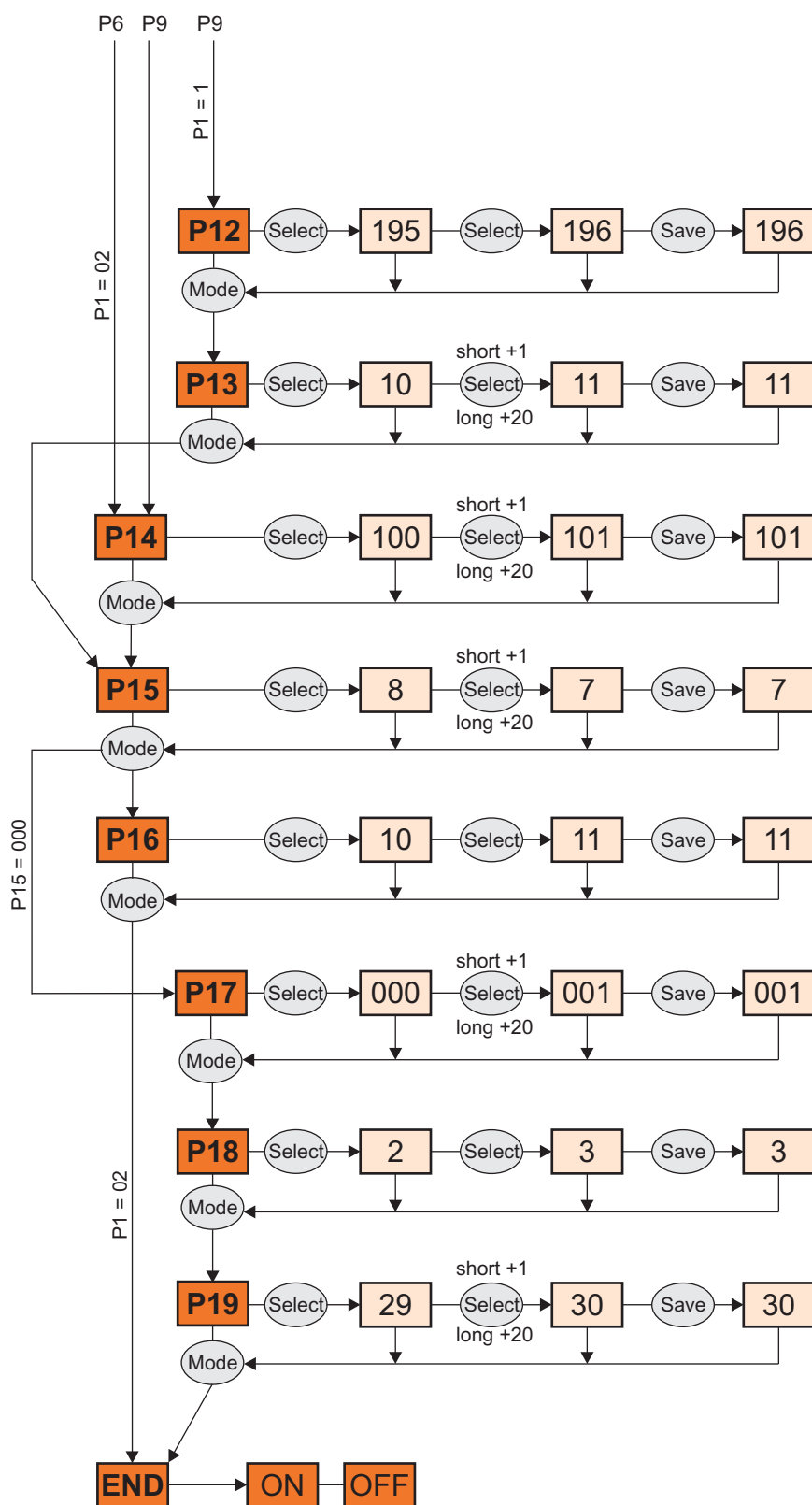
P9: Lower row delivery time²⁾ min.:
 Delivery time setting in minutes (1-59) Only for P5 = distributor pulse 000
 Default: 1

- ¹⁾ Cycle time = delivery time + idle time
²⁾ Lower row delivery time + upper row delivery time
 < smallest cycle time of the lower or upper row

- Subject to modifications -



- Subject to modifications -



P12: Upper row cycle time¹⁾²⁾h:
Cycle time setting in hours
(0-255) Only for P1 = time mode
Default: 0

P13: Upper row cycle time¹⁾²⁾min:
Cycle time setting in minutes
(1-59) Only for P1 = time mode
Default: 2

P14: Upper row pulses:
Pulse setting (1-999)
Only for P1 = pulse mode
Default: 5

P15: Upper row distributor pulse:
Stops pumping action acc. to preset pulse
number 001 = ON, 000 = OFF
Default: 000

P16: Upper row distributor pulse number:
Distributor pulse setting (1-100)
For P15 only = Distributor pulse 001
Default: -

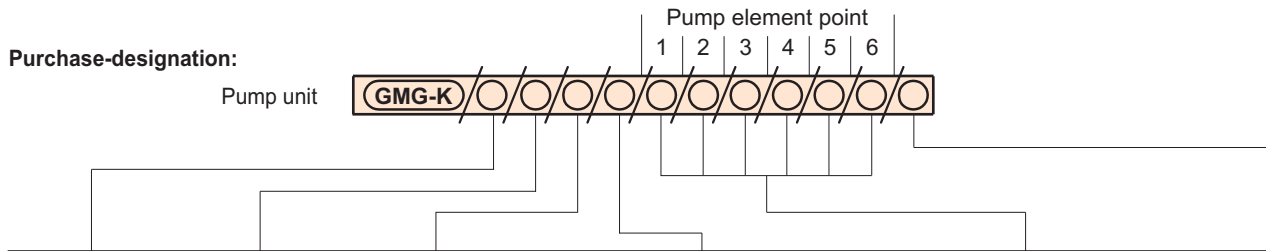
P17: Upper row distributor monitoring:
Fault message release after 4 minutes without
distributor signal 001 = ON, 000 = OFF
Default: 000

P18: Lower row delivery time²⁾h:
Delivery time setting in hours
(0-100) Only for P15 = distributor pulse
000

P19: Lower row delivery time²⁾min:
Delivery time setting in minutes
(1-59) Only for P15 = distributor pulse 000
Default: 1

¹⁾ Cycle time = delivery time + idle time

²⁾ Lower row delivery time + upper row
delivery time
< smallest cycle time of the lower or
upper row



Reservoir	Level monitoring	Filling connector	Version	Pump element ²⁾	Electric control unit
For grease: 1.0l without filler cap (1)	For grease: Intermittent min. level monitoring (C)	Pneumatic-type lubricating nipple DIN71412 (A)	2-row for 6 pump elements at max.: Separated delivery by the lower and upper pump elements (2S)	with threaded connector M18x1.5: 0,04cm ³ 0,08cm ³ 0,16cm ³ (04) (08) (16)	without connectors for distributor monitoring (C)
For oil: 1.0 l with filler cap (1EF)	For oil:¹⁾ Min. level monitoring (F)	Button-head lubricating nipple DIN 3404-M22 (C)	1-row for 3 pump elements at max.: Delivery and agitation ¹⁾ always concurrently (1F)	with connector for progressive distributor: 0,08cm ³ 0,16cm ³ (08P) (16P)	with connectors for distributor monitoring (C2)
	without (0)	Closing nipple (G)	separated delivery and agitation ¹⁾ (1S)	without pump element (0)	without control unit (0)

¹⁾ In case of level monitoring "F", there is no lubricant agitation.

²⁾ At points 2 and 5, no pump element with connection for progressive distributor is possible.
If a pump element with connection for a progressive distributor has been provided for at point 1, then no other pump element will be possible at point 4.

Purchase example: Version with 1 pump element row:

GMG-K pump unit with 1-litre reservoir, incl. level monitoring "C"; filling connection "G"; 1-row version with separated delivery and agitation, and pump element located at point 1: with 0,16cm³ delivery volume and connection for progressive distributor.
point 2: without pump element.
point 3: with 0,8cm³ delivery volume and threaded connector with electric control "C2"

Purchase designation:

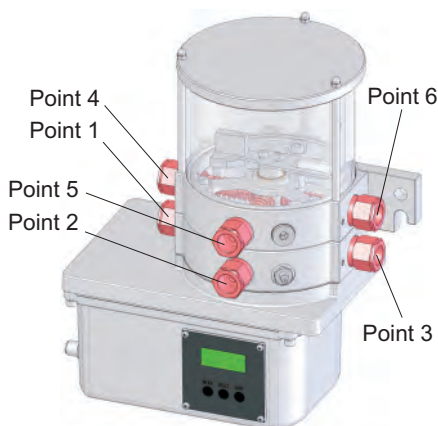
GMG-K/1/C/G/1S/16P/0/08/C2

Purchase example: Version with 2 pump element rows:

GMG-K pump unit with 1-litre reservoir, incl. level monitoring "C", filling connection "G"; 2-row version, pump element located at point 1: with 0,16cm³ delivery volume and connection for progressive distributor, point 2: without pump element, point 3: with 0,8cm³ delivery volume and threaded connector point 4: without pump element, point 5: without pump element, point 6: with 0,16cm³ delivery volume and connection for progressive distributor, with electric control "C2"

Purchase designation:

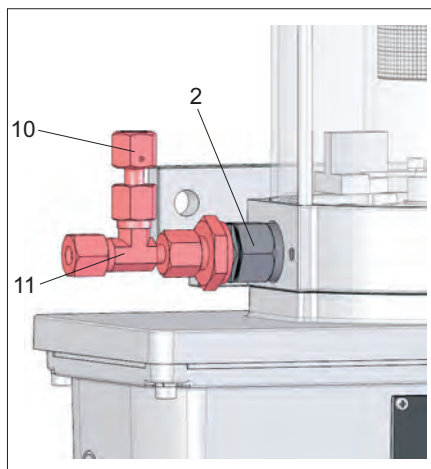
GMG-K/1/C/G/2S/16P/0/08/0/0/16P/C2



- Subject to modifications -



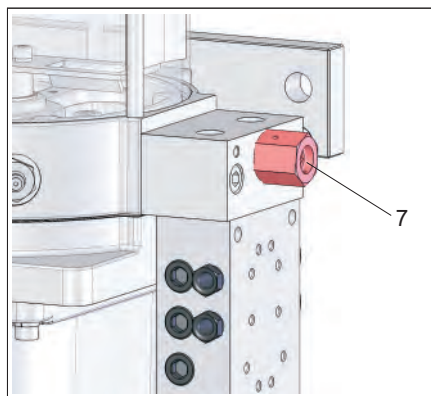
Auxiliaries: (Please state purchase-no)



Pressure control valve at the pump element:

To limit the operating pressure, pressure control valves **10** can be connected to pump element **2**.

Pressure control valve 10 with opening pressure:	Purchase no.:	Screwing set 11 for pipe:	Purchase no.:
70 bar	752.502-65	Ø 6	752.502-68
150 bar	752.502-62	Ø 8	752.502-63
250 bar	752.502-90	Ø 10	752.502-64
preset acc. to customer's specification:			
50 - 160 bar	752.502-66		
160 - 250 bar	752.502-67		



Pressure control valve at the progressive distributor:

For maximum operating pressure limitation instead of venting screw **6**

Pressure control valve 7 with opening pressure:	Purchase no.:
70 bar	110.566-65
150 bar	110.564-65
preset acc. to customer's specification:	
50 - 150 bar	110.568-65

Auxiliary for filling connector "G":

Coupling 954.002-09
(p_{max} = 35 bar)

Connecting cable for electrical connection (motor connector):

Operating voltage: 10 ... 30 VDC
cable cross-section: 4x0,34 mm²
Protection system: IP67
Connection type: 4-pin socket M12

Purchase number
10 m cable length: **913.404-65**
15 m cable length: **913.405-07**

Cable for progressive distributor connection to control unit "C2":

Connection type: plug to socket, 4-pin
M12 - M12

Purchase number
0,6 m cable length: **913.405-23**
2 m cable length: **913.405-06**
(other cable lengths available on request)

Connecting cable for level connector: (version without control unit)

Connection type: plug, 4-pin M12

Purchase number
5 m cable length: **913.404-46**
(other cable lengths available on request)

Power pack (optional) connection for 230VAC:

Power pack for 86-264VAC connection;
Output: 24VDC/3A **470.218-60**

Important information on this publication

Reproduction, also in extracts, only permitted with the approval of the firm of EUGEN WOERNER GmbH & Co. KG.

All the information in this publication has been examined for correctness with great care. Nevertheless, WOERNER cannot assume any liability for losses or damage resulting directly or indirectly from the application of the information contained in this publication.

All products from WOERNER may only be used as intended and corresponding to the information in this publication.

For products supplied with operating instructions, the additional directives and information contained in them are to be complied with.

Materials deviating from those mentioned in this publication and the technical documents which further apply may only be poured into and processed in the appliances and systems manufactured and supplied by WOERNER by following agreement with and written approval by WOERNER.

The safety and danger information stated in the safety data sheets of the substances used must be taken into account at all costs.

Transportation of gases, liquefied gases, gases under pressure, vapours and liquids, the vapour pressure of which is more than 0,5 bar above normal atmospheric pressure (1013 mbar) at the maximum admissible temperature, of easy inflammable or explosive media as well as transportation of foodstuffs is forbidden.

Information on EU Directive 2002/95/EC (RoHS)

With Directive 2002/95/EC of January 27, 2003, for the limitation of the use of certain hazardous substances in electrical and electronic devices (RoHS) material bans come into effect from July 2006 for electrical and electronic devices newly placed on the market for lead, cadmium, hexavalent chromium, mercury and brominated flame retardants.

In its controls and switching devices, WOERNER only uses materials which fulfil the criteria of EU Directive 2002/95/EC.

To the extent that hexavalent chromium has been used as corrosion protection in the parts which we produce ourselves, it has already been replaced by other environmentally tolerable protective measures.

The mechanical devices supplied by WOERNER are not affected by EU Directive 2002/95/EC as they are appliances added or installed on "large-scale stationary industrial tools" (cf. EU Directive 2002/96/EC, Annex IA).

But as WOERNER is conscious of its responsibility towards the environment, we shall also use materials fulfilling the requirements of the Directive for devices not covered by EU Directive 2002/95/EC as soon as they are generally available and their use is technically possible.

Technical documents also valid for this product:

B0793 Operating instructions GMG-K/GMG-L