Q-Smart

Single Phase Electronic Control Panel

LOWARA
a xylem brand

Applicare qui l'adesivo col codice a barre

Apply the adhesive bar code nameplate here

Cod.001085042 rev.B ed.09/2017

1.2 Safety terminology and symbols

Hazard levels

Symbol	Indication
DANGER	A hazardous situation which, if not avoided, will result in death or serious injury
WARNING	A hazardous situation which, if not avoided, could result in death or serious injury
CAUTION	A hazardous situation which, if not avoided, could result in minor or moderate injury
NOTICE:	• A potential situation which, if not avoided, could result in undesirable conditions • A practice not related to personal injury

Hazard categories

Hazard categories can correspond to either hazard levels or to specific symbols that replace the ordinary hazard level symbols.
Electrical hazards are indicated by the following specific symbols:

ELECTRICAL HAZARD:

1.3 Inexperienced users

WARNING:
This product is intended to be operated by qualified personnel only.

Be aware of the following precautions:

- This product is not to be used by anyone with physical or mental disabilities, or anyone without the relevant experience and knowledge, unless they have received instructions on using the equipment and on the associated risks or are supervised by a responsible person.
- Children must be supervised to ensure that they do not play on or around the product.

1.4 Warranty

For information about the warranty, see the sales contract.

1.5 Spare parts

WARNING:
Only use original spare parts to replace any worn or faulty components. The use of unsuitable spare parts may cause malfunctions, damage, and injuries, as well as void the warranty.

For more information about spare parts for the product, refer to the Sales and Service department.

1.6 EC Declaration of Conformity

Xylem Service Italia S.r.l., with headquarters in Via Vittorio Lombardi 14 - 36075 Montecchio Maggiore VI - Italy, hereby declares that the product

Q-SMART control panel for electric pumps (see label on first page)

fulfills the relevant provisions of the following European directives
- Low Voltage 2006/95/EC (year of first mark: 2016)
- Electromagnetic compatibility 2004/108/EC

and the following harmonised technical standards
- EN 60730-1:2011, EN 60204-1:2006+A1:2009, EN 61439-1:2011, EN 61439-2:2011
- EN 61000-6-1:2007, EN 61000-6-3:2007+A1:2011

Montecchio Maggiore,
18.02.2016
Amedeo Valente
(Director of Engineering and R&D)
rev.00

2 Transportation and Storage

2.1 Inspection and delivery

1. Check the outside of the package.
2. Notify our distributor within eight days of the delivery date, if the product bears visible signs of damage.
3. Open the carton.
4. Remove packing materials from the product. Dispose of all packing materials in accordance with local regulations.
5. Inspect the product to determine if any parts have been damaged or are missing.
6. Contact the seller if anything is out of order.

2.2 Transportation and guidelines

Precaution

WARNING:
- Observe the accident prevention regulations in force.

Check the gross weight indicated on the package in order to select the proper lifting equipment.

Position and fastening
Make sure that the unit is securely fastened during transportation and cannot roll or fall over. The product must be transported at an ambient temperature between -10°C and 70°C (14°F to 158°F) with a non-condensing humidity of <90%, and protected against dirt, heat sources, and mechanical damage.

2.3 Storage guidelines

2.3.1 Storage location

NOTICE:
- Protect the product against humidity, dirt, heat sources, and mechanical damage.
- The product must be stored at an ambient temperature between -10°C and 70°C (14°F and 158°F) and a non-condensing humidity below 90%.

3 Product Description

3.1 Product overview

The Q-SMART control panel is a single-phase electronic control panel intended to be used with 1 or 2 single-phase electric pumps for different fixed speed applications.
It is suitable for pressurisation, emptying or sewage systems. Check your type of installation and change the parameters (see sections *5.4.3*, *5.4.4* and *10.1*) accordingly.

3.2 Product name

Example: Q-SMART 10/15/D 12A	
Q-SMART	Trade name of control panel. Mains power supply, single-phase 1x230Vac 50/60Hz
10	Number of pumps that can be connected 10: One 20: Two
15	Nominal motor power kW x 10 15=1.5kW x 10
D	Default software application D: sewage/lifting B: booster/pressurisation
12A	Maximum current absorbed by one electric pump

3.3 Technical data

Tab 1 Standard version

Control panel model	Q-SMART 10	Q-SMART 20
Rated voltage input (Uin)	1x230VAC (-15% to +10%)	
Rated input fre-	50/60 Hz	

quency		
Rated input current [1] (Uin=230V)	12A	24A
Recommended line protection [2]	20A	40A
Rated output current (Uin=230V)	12 A	2 x 12 A
Consumption in standby	1.8W (standby power may vary according to the type of sensor connected)	
Type of load	Electric motor	
Nominal Cosø	≥ 0.6	
Box	Self-extinguishing - grey	
Frontal IP Protection	55	
Connections (use copper conductor only)	Screw terminal blocks (power supply, input and output)	
Maximum input power cable section	4 mm^2	
Maximum motor power cable section	4 mm^2	
Set point [3]	Pressure: 0 to 60 bar (0 to 6 MegaPa) Level: 0 to 50 m (0 to 164 feet) Temperature: -20 to 100°C (32 to 122°F)	
Ambient temperature	0 to 40°C (32 to 122°F)	
Ambient Humidity	10 to 90% non-condensing	
Altitude [4]	≤2000m asl	
Alarm buzzer	3.6kHz, Piezo	
Motor protection fuse F1, F2	12 A (gG) CH10 10.3x38 mm	
Auxiliary protection fuse F3	1A Time-Lag 5 x20 mm (T1L 250V IEC60127-2/3)	
Digital inputs	5 multifunctional inputs for NO/NC contact (voltage-free, 12V, 4mA)	
Electric Probe inputs	4 level electrode sensors, 1 reference electrode Sensitivity: 5 to 100kOhm, Line capacity: 10nF max, Electrode voltage: 6.5V - 20Hz	
Analogue input	Transducer 0-20/4-20mA (Sensor active value input) Current input 0-22 mA, accuracy 0.3%, Sensor power supply +12 Vdc	
Digital outputs	1 Load relay	2 Load relays
	30(15)A @ 250VAC Maximum current allowed for the electric motor is 12A	
TTL Serial port	Port for communication with the supervision system via TTL with	
	ModBus communication protocol Signals: +5V, RX, TX, RTS, 0V	
RJ45 connector	Port RJ45 for communication with the card with voltage-free relays Signals: +12V - 120mA , 0V, 6 open collector outputs	
Dimensions and Weight	See Figure *3*	

1. The current supplied by the control panel shall not be lower than the current absorbed by the electric pumps, and depends also on the voltage drop due to the length of the cable.
2. Choose the current of the line protection device in relation to the maximum current absorbed by the motors.
3. Only if the electronic sensor is used.
4. For higher altitudes or other environmental conditions not covered in this manual, please contact your local After Sales / Service representative.

3.4 Pump specifications

Refer to the user and maintenance manual of the electric pump. It is essential to consider the limitations of use of the control panel together with those of the electric pump. See the *Technical* data in *Tab 1*. The customer is responsible for checking the limitations of the electric pump if they are not specified in this manual.

4 Installation

Precaution

WARNING:
- Observe the accident prevention regulations in force.
- Use suitable equipment and protective devices.
- Always refer to the local regulations, legislation and codes in force regarding the selection of the installation site, plumbing and power connection.

4.1 Electrical requirements

The local regulations in force overrule the specific requirements given below.

Electrical connection checklist

Check that the following requirements are met:

- The electrical leads are protected against high temperature, vibrations and collisions.
- The current type and voltage of the mains connection must correspond to the specifications on the data plate on the pump.
- It is recommended to provide electrical power to the control panel with a dedicated power line equipped with:

- A high-sensitivity differential switch (30 mA) [residual current device RCD].
- A mains isolator switch with a contact gap of at least 3 mm.

Control panel checklist

NOTICE:
The control panel must be compatible with the data of the electric pump powered by the same panel. It is essential to consider the limitations of use of the control panel together with those of the electric pump. Inappropriate combinations do not guarantee the functionality and protection of the electric pump and control panel.

Check that the following requirements are met:

- The control panel must protect the pumps against short circuits. A time lag fuse or a circuit breaker (Type C model is suggested) can be used to protect the control panel.
- A time lag fuse which is inside the control panel protects the pump against short circuits. A 12A gG fuse for the pumps is provided (F1, F2). Refer to Figure *7*.
- The control panel must be programmed correctly. Refer to the "*Start-up and programming*" section (sections *5.4.3*, *5.4.4*)

Motor checklist

Use a 3-wire power cable (2 + earth/ground). All cables must be heat-resistant up to a minimum of +70°C (158 °F).

4.2 Mechanical installation

NOTICE:

- Incorrect mechanical installation can cause the control panel to malfunction and break.
- Read this manual and the manual for the electric pump before installation.

Ensure that the following conditions are met:

- Refer to figure *4* for proper mounting of the control panel.
- Do not install the control panel in an area exposed to direct sunlight and/or near heat sources. Refer to the ambient temperature range in the
- *Technical* data section.
- Install the control panel and the electric pump in a dry, frost-free site, observing the limitations of use and ensuring the motor is sufficiently cooled.
- Do not use the product in explosive atmospheres or in the **presence of corrosive and/or flammable dust, acid, or gas.**

4.3 Electrical installation

Precaution

WARNING:

- Make sure that all connections are executed by a qualified installer and in compliance with the regulations in force.
- Before running the unit (control panel and electric pump), make sure that the unit and the control panel are isolated from the power supply and cannot be energised.

Grounding (earthing)

Electrical hazard

- Always connect the external protection conductor to the ground (earth) terminal before making other electrical connections.

NOTICE:
Make sure that there are no bits of wire or sheathing or other foreign materials in the control panel when making the electrical connections. Take all due care to avoid damaging the internal parts when removing anything inside.

4.3.1 Terminals

Refer to Figure *7*

N°	Means/Connection	Plastic signature
1	Mains power supply 1x230Vac, 50/60Hz	Overload Circuit breaker 1P+N, In=32A
2	2.1) M1= Electric pump 1 supply 1x230Vac, $I1_{max}$=12A 2.2) M2= Electric pump 2 supply 1x230Vac, $I2_{max}$=12A	2.1) U1M1=L1 U2M1=N1 2.2) U2M2=N2 U1M2=L2
3	Analogue and digital sensors 3.1) Pressure/ temperature/ level sensor 3.2) Programmable Digital input 3.3) Minimum pressure switch or Minimum level switch 3.4) Maximum pressure switch or High level switch 3.5) Pressure/Float switch pump1 3.6) Pressure/Float switch pump2 3.7) Electric probes 3.7.1) Common 3.7.2) Minimum level 3.7.3) Start/stop Pump 1 3.7.4) Start/stop Pump 2 3.7.5) High level	AI/DI, Analogue and Digital inputs 3.1) AI (0/4-20mA) 3.2) D IN PROG 3.3) P MIN / G MIN 3.4) P MAX / G MAX 3.5) P1/G1 3.6) P2/G2 3.7) Electric probes 3.7.1) S COM 3.7.2) S MIN 3.7.3) S 1 3.7.4) S 2 3.7.5) S MAX

4	RJ 45 fast connection for voltage-free contacts	RILS
5	Switches for Electronic bypass: M1: electric motor 1 control M2: electric motor 2 control (see section 4.6)	M1 M2
6	RTU 485 Modbus connection	TTL
7	Inner casing for RTU 485 Modbus kit.	-

4.3.2 Mains power supply connection

NOTICE:
The cross-section of the main power supply cable is suitable for the maximum current consumption of the electric motor and also considering the maximum voltage drop (≤4%).

Installation and replacement of the main power supply cable

Refer to figures *5*, *6*, *7* and *8*.	1. Ensure that the control panel is isolated from the power supply and cannot be energised. 2. Open the front covers (1) and (3), and turn the main switch (2) OFF. 3. Unfasten the 4 screws M4x25 and open the REAR cover (see Figure *6*). 4. Insert the power cables in the relevant cable gland (1), Figure *5*. 5. First connect the ground cable to the relevant terminal and then connect the other cables. It is good practice for the ground cable to be longer than the other cables, Figures *7* and *8*. 6. Check that all the cables are secured, close the REAR cover and fasten the screws if no other cables have been connected.

NOTICE:
If some models have a power supply cable with a cross-section of 4G2.5mm2, this is only for the internal production test. Check the voltage drop (≤4%) and replace it with a cable of an appropriate cross-section.

4.3.3 Motor power cable connection

If the power cable of the motors needs to be added or replaced, fit a new one of a cross-section suited to the maximum current consumption of the electric motor and taking into account also the maximum voltage drop (≤4%).

Refer to figures *5*, *6*, *7*, *8*.	1. Make sure that the control panel is isolated from the power supply and cannot be energised. 2. Open the front covers (1) and (3), and turn the main switch (2) OFF. 3. Unfasten the 4 screws M4x25 and open the REAR cover (see Figure *6*). 4. Insert the motor power cables in the relevant cable glands (3) (5), Figure *5*. 5. First connect the ground cable to the relevant terminal and then connect the other cables. It is good practice for the ground cable to be longer than the other cables, Figures *7* and *8*. 6. Check that all the cables are secured, close the REAR cover and fasten the screws if no other cables have been connected.

4.3.4 I/O connections

The terminals must be chosen according to the application and the type of sensor used (figures *7* and *9*). For application, refer to figures *11* to *64*

Refer to figures *5*, *6*, *7* and *9*.	1. Make sure that the control panel is isolated from the power supply and cannot be energised. 2. Open the front covers (1) and (3), and turn the main switch (2) OFF. 3. Unfasten the 4 screws M4x25 and open the REAR cover (see Figure *6*). 4. Insert the cables in the relevant cable glands, Figure *5*, section *4.5*. 5. Connect the cable to the relevant terminals, Figures *7* and *9*. 6. Check that all the cables are secured, close the REAR cover and fasten the screws if no other cables have been connected.

4.3.5 Replacement of Fuse F1 or F2

If Fuse F1 or F2 needs to be replaced because it is defective, replace it with one of the correct characteristics.
Alarm A01 indicates that Fuse F1 is defective.
Alarm A02 indicates that Fuse F2 is defective.

Refer to figures *5*, *6*, *7* and	1. Make sure that the control panel is isolated from the power supply and cannot be energised. 2. Open the front covers (1) and (3),

8.	and turn the main switch (2) OFF. 3. Unfasten the 4 screws M4x25 and open the REAR cover (see Figure 6). 4. Use a proper tool to remove fuse F1 (alarm A01) or F2 (alarm A02). 5. Replace the Fuse according to the correct 6. *Technical* data, see *Tab 1*. 7. Close the REAR cover and fasten the screws if no other cables have been connected.

4.4 Analogue sensor

An analogue sensor with 0/4-20mA output is required to show the pressure, level or temperature of the system (refer to figures *7* and *9*).
A sensor offers the possibility of additional functions.
See section *5.3 Start-up and programming*.

4.5 Cable glands and terminals

4.5.1 Q-SMART 10/bS set for pressurisation

Refer to figures *5*, *7* and *9*
The following values are recommended

# (Figure *5*)	Means/Connection (Figures *7*, *9*)	Serigraphy Q-SMART (Figures *7*, *9*)	Possible cable diameter (mm)
1	- Input power supply	1x230Vac	7 to 13
2	- Pressure switch P1 - Common Probe	P 1 S COM	5 to 10
3	- Motor Pump 1	M 1	7 to 13
4	- Sensor	A IN	5 to 10
5	- Maximum pressure switch - Minimum level probe - Multiwire probe cable(1)	P MAX S MIN	7 to 13
6	- Minimum pressure switch - Minimum level Float switch - Maximum pressure switch	P MIN G MIN P MAX	5 to 10

(1) Connect the multiwire cable to a junction box, and then each probe with its cable.

4.5.2 Q-SMART 20/bS set for pressurisation

Refer to figures *5*, *7* and *9*

# (Figure *5*)	Means/Connection (Figures *7*, *9*)	Serigraphy Q-SMART (Figures *7*, *9*)	Possible cable diameter (mm)
1	- Input power supply	1x230Vac	7 to 13
2	- Pressure switch P1 - Multiwire pressure switch cable (1) - Multiwire probe cable (1)	P 1 P 2 P MAX S COM S MIN S 1 S 2 S MAX	5 to 10
3	- Motor Pump 1	M 1	7 to 13
4	- Sensor - Pressure switch P2	A IN P 2	5 to 10
5	- Motor Pump 2	M 2	7 to 13
6	- Minimum pressure switch - Minimum level Float switch - Multiwire probe cable(1) - Multiwire pressure switch cable(1)	P MIN P MAX G MIN S COM S MIN S MAX	5 to 10

4.5.3 Q-SMART 10/SE sewage drain/filling set

Refer to figures *5*, *7* and *9*

# (Figure *5*)	Means/Connection (Figures *7*, *9*)	Serigraphy Q-SMART (Figures *7*,	Possible cable diameter (mm)

		9)	
1	- Input power supply	- 1x230Vac	7 to 13
2	- Maximum level Float switch - Maximum level Probe	- G MAX - S MAX	5 to 10
3	- Motor Pump 1	- M 1	7 to 13
4	- Sensor Level Probe Pump 1	- A IN - S 1	5 to 10
5	- Float switch Pump 1 - Common Probe - Multiwire probe cable(1)	- G1 - S COM - S MIN - S 1 - S MAX	7 to 13
6	- Minimum level Float switch - Minimum level Probe	- G MIN - S MIN	5 to 10

4.5.4 Q-SMART 20/SE sewage drain/filling set

Refer to figures 5, 7 and 9

# (Figure 5)	Means/Connection (Figures 7, 9)	Serigraphy Q-SMART (Figures 7, 9)	Possible cable diameter (mm)
1	- Input power supply	- 1x230 Vac	7 to 13
2	- Multiwire probe cable(1) - Multiwire float switch cable(1)	- S COM - S MIN - S 1 - S 2 - S MAX - G 1 - G 2 - G MAX	5 to 10
3	- Motor Pump 1	- M 1	7 to 13
4	- Sensor	- A IN	5 to 10
5	- Motor Pump 2	- M 2	7 to 13
6	- Minimum level Float switch	- G MIN	5 to 10

4.6 POWERING THE ELECTRIC PUMPS IN AN EMERGENCY

In case the software or electronics of the Q-SMART control panel is blocked, the pumps can be powered by changing the position of the jumper switches M1 and M2 (refer to figures 7 and 10).

WARNING:

- Make sure that this operation is performed by qualified installation technicians and in compliance with the regulations in force.
- Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energised.
- This operation must be carried out only in the case of emergency.

5 System Description

5.1 User interface

The list describes the parts in Figure 1.

Number	Description
1 and 2	**In MANUAL (MAn) mode:** 1 = Button for running the electric pump 1. Press and hold the button to run. 2 = Button for running the electric pump 2. Press and hold the button to run. **In STANDBY (StY) mode:** 1,2 Increasing or decreasing the value of a parameter selected in STBY mode
3	Type of display: Three digit LEDs with light symbols
4	Button for switching between the operating modes: • AUTOMATIC (Aut) • MANUAL (MAn) and • STANDBY (StY) (enable programming menu)
5	Button for confirming the menu and data.

5.2 Display information

This list describes the parts shown in figure 2.

Number	Description
1	Green-lighted LED, indicating that pump 1 is running
2	Blue-lighted LED, indicating AUTOMATIC mode
3	Green-lighted LED, indicating that pump 2 is running
4	Red-lighted LED, indicating a fault. The LED is illuminated when there is an alarm.
5	Yellow-lighted LED in MANUAL mode

6	Red-lighted LED indicating: • Lack of water alarm ON, for booster application or • High level alarm ON, for sewage application.
7	Red-lighted LED indicating Temperature °C, if selected
8	Red-lighted LED indicating head (water column) in m, if selected
9	Steady green-lighted LED, indicating the power is on
10	Red-lighted LED indicating pressure in bar, if selected

5.2.1 Locking/unlocking the user interface

The buttons (4) are enabled in AUTOMATIC or MANUAL mode and allow the user to view the operation and alarms log (see section *5.4.2*) or to access the menus and edit the operating parameters (see section *5.4.3*).

5.3 Start-up and programming

NOTICE:

- If supplied individually, **THE DEFAULT SOFTWARE IS:**
  - **SEWAGE (SE) for Q-SMART10../D, Q-SMART20../D, see section *3.2* and *5.4.3 tab. 2***
  - **PRESSURISATION (bS) for Q-SMART10../B, Q-SMART20, see section *3.2* and *5.4.3 tab. 3.***

Edit the values according to the type of electric pump and system, see section *5.4.4* and refer to figures 11 to 64.

- When the control panel is already connected to an electric pump or a booster set, the same has been programmed based on the characteristics of the electric pump, and the default values may change. Edit the function values of the system.
- Incorrect configuration can damage the electric pump and/or the system.

Refer to figures *1* and *2* for the user interface.

1. Check that all the mechanical, electrical and hydraulic connections have been made. See *Mechanical installation* section *4.2*, *Electrical installation* section *4.3*.
2. Turn on the power at the main switch (1) figure 7 and the control panel starts up.
3. The control panel performs an internal hardware Auto-test and the LED (9) turns on. It is possible to enter the CONFIGURATION MENU to set the proper application (refer to figures 11 to 64).

NOTICE:

- Start-up mode after a shutdown is always AUTOMATIC, and cannot be changed.
- In automatic mode, the electric pump runs if the pressure, level or temperature of the system is below the value selected. If necessary, press (4) to set MANUAL mode and the electric pump turns off if running.

The parameters in the PARAMETER menu can be edited ONLY in STANDBY (StY) mode. Press (4) to switch between AUTOMATIC or MANUAL and STANDBY (StY) mode; the LEDs (5) and (2) are off. See section *5.4.4* for the proper procedure.

5.4 Programming

The control panel has three menus that can be accessed with a combination of keys:

- QUICK CONFIGURATION (see section *5.4.3*)
- ALARMS LOG (see section *5.4.2*).
- PARAMETERS (see section *5.4.4*).

5.4.1 Texts shown on the display

Sim	Description
MAn	Operation Manual mode: pump is stopped
Aut	Operation Automatic mode.
StY	Standby mode: Programming is enabled
cnf	Software selection (sE or bS)
SE	The Q-SMART control panel is set in SEWAGE mode.
bS	Q-SMART control panel is set in Pressurisation BOOSTER mode.
c	Configuration parameter
t	Timing parameter
r	Adjustment parameter menu
h	Hour and Data value
---	Shown on display when the analogue sensor is not used. The digital sensor is used.
run	When the analogue sensor is not used (no feedback), the pump is running
A	Alarm log
tSt	Auto-test running
OFF	Q-SMART control panel is disabled by the external command switch connected to the D IN PROGR (figure *9*) The status of the alarm in the alarm log.
On	The status of the alarm in the alarm log.
P1	Pump 1 runs
P2	Pump 2 runs

5.4.2 Alarm log

It is possible to view information concerning any alarms in either MANUAL or AUTOMATIC mode. The menu is read-only and displays the last 20 alarms that have occurred.

Refer to figures *1* and *2*.

- Press and hold (4) for a few seconds to access the menu. The LED (4) switches off.
- Press (1) or (2) to select the alarm, and press (5) to confirm.
- Press (5) several times and the following data are displayed in sequence: alarm code, status (OFF, ON), and day, month, year, hour, minute, to indicate the time of occurrence.
- Press (4) to exit or (1) or (2) to select another alarm in the list.

Example in figure 65

Alarm number 20, type A53,
- deactivated (OFF) 12/11/2015 at 21h:36m
- activated (ON) 12/11/2015 at 20h:58m

5.4.3 Configuration menu

This is used for quick application selection (see Figures 11 to 64).
SELECTION MUST BE DONE ONLY DURING POWER-UP.

1. Refer to figure *6*: Turn on the main switch (2).
2. Refer to figures *1* and *2*: Press buttons (1) and (2) at the same time during power-up; LED (9) is illuminated and “cnf” appears on the display.
3. Press (5), and the actual configuration is shown.
4. Press button (1) or (2) to edit the type of configuration:
   - **SE:** Sewage.
   - **bS:** booster pressurisation.
5. Press button (5) to confirm
6. 1P or 2P are shown on the display.
7. Press button (1) or (2) to edit the number of pumps:
   - **1P:** one pump
   - **2P:** two pumps
8. Press button (5) to confirm.
9. **P** or **S** are shown on the display. Press button (1) or (2) to edit.
   If pressurisation mode is set (bS):
   - **P:** Pump control from pressure switch. P1, P2, PMAX, PMIN enabled.
   - **S:** Pump control from electronic pressure sensor (A IN). A IN, P MAX, P MIN enabled.

If sewage mode is set (SE):
- **G:** Pump control from pressure switch floats. G1, G2, GMAX, GMIN enabled.

10. Press button (5) to confirm
11. Turn the control panel off and then on again. The new application is now activated.

5.4.4 Parameter menu

All the operating parameters can only be selected and modified in STANDBY mode (StY) (see *Tab 2* or *Tab 3*).

NOTICE:
After 3 minutes of inactivity and if no button is used, automatic mode is restored.

The pump remains in standby during configuration.

Refer to figures *1* and *2*

1. Press and hold (4) to access STANDBY (StY) mode.
2. LEDs (2) and (5) switch off. LED (9) is ON.
3. Press (5) to access the parameter menu.
4. “000” flashes.
5. Press (1) or (2) to edit the password 066.
6. Press (5) to confirm. If password is wrong press (4) for read-only mode.
7. Press (1) and (2) to view the parameter
8. Press (5) to edit the parameter. It flashes.
9. Press (1) or (2) to modify the value.
10. Press (5) to confirm.
11. Press (1) or (2) to confirm and move on to the next parameter or press (4) for AUTOMATIC or MANUAL mode.
12. Repeat points 7 to 9.
13. Press (4) for AUTOMATIC or MANUAL mode.
14. Switch off and back on.

Tab 2 SEWAGE Application
(parameter SE is selected, section *5.4.3*)

Par.	Description	Range	Unit	Default
SYSTEM				
c01	Number of pumps	1= 1 pump 2= 2 pumps	-	depending on the control panel model
c02	Filling function. (Refer to figures 11 to 16, 39 to 46, 54 to 64)	0= Disabled 1= Enabled	-	0
c03	Type of sensor that is used.	1= Float switches 2= Sensor level 3= Probes 4= Level sensor with automatic switching to float if sensor is faulty 5= Level sensor with automatic switching to probes if sensor is faulty	-	1

c04	Sensor signal type	1= 4-20mA 2= 0-20mA	-	1
c05	Initial scale value of the sensor. Only if sensor is used.	Pressure: 0 to 60 bar Temperature: -20 to 100°C Level: 0 to 50 m	various	0
r05	Calibration of the initial scale in mA.	0= Disabled 1= Enabled	-	0
t05	Software filter for analogue input	Standard Lowara	-	3
c06	Full scale value of the selected sensor. Only if sensor is used.	Pressure: 0 to 60 bar Temperature: -20 to 100°C Level: 0 to 50 m	Various	10.0
THRESHOLD AND TIMING (threshold is active only with sensor)				
c07	Unique level set point	0= Disabled 1= Enabled	-	0
r07	Set point level value	0 to Full Scale	Various	5
r08	Upper threshold delta	0 to Full Scale	Various	0.5
r09	Lower threshold delta	0 to Full Scale	Various	0.5
r10	Threshold Start Pump 1	0 to Full Scale	Various	8
t10	Delay time start Pump 1	0 to 100	sec	2
r11	Threshold Stop Pump 1	0 to Full Scale	Various	2
t11	Delay time stop Pump 1	0 to 100	sec	0
r12	Threshold Start Pump 2	0 to Full Scale	Various	7
t12	Delay time start Pump 2	0 to 100	sec	2
r13	Threshold Stop Pump 2	0 to Full Scale	Various	1
t13	Delay time stop Pump 2	0 to 100	sec	0
COMBINATION (refer to section *6.2* for description)				
c14	Enable combinations of stopping and/or starting the pumps by the float switches (G) and probes (S).	0= only G1 and G2 1= only G MIN and S MIN connected (float switch or probe S MIN + common S COM probe) 2= only G MAX and S MAX connected (float switch or probe S MAX + common S COM probe) 3= G MIN/S MIN and G MAX /S MAX	-	3
STARTING PUMP ROTATION				
c15	Enable pump rotation. Automatic pump rotation takes place each time the set is restarted after stopping in automatic mode. If cyclic exchange of the pumps is disabled, the floats or probes must be connected to their relative pumps: P1-G1 (or S1), P2-G2 (or S2). This function is essential when the pumps are located at different stations.	0= Disabled 1= Enabled	-	1
c16	Insert the duty pump that you want to start first after powering up or after reset. Parameter c15 must be in ENABLED mode	1= Pump 1 2= Pump 2	-	1
c17	If automatic pump rota-	0= Disabled 1 to 12	Hours	0

	tion does not take place (the set has never been able to stop), a “forced” rotation of the duty pumps is performed when the set time has elapsed.	hours		
c18	Settable only in the case of systems with sensor. Halves the timing (t10, t11, t12, t13) in the case of excessive variation of the feedback (pressure, levels, temperature).	0= Disabled 1= Enabled	-	0
REAL TIME CLOCK				
h19	Setting the date	Y	-	
h20	Setting the month	M= 1 to 12	-	
h21	Setting the day	d= 1 to 31	-	
h22	Setting the hour	h= 0 to 23	-	
h23	Setting the minute	m= 00 to 59	-	
AUTO-TEST RUN With this function, the pumps are started once per week and at a set time and day, or after a time of inactivity. **(Refer to section *6.1* for description)**				
c24	Enabling periodic Auto-test	0= Disabled 1= Weekly 2= Time of inactivity	-	0
t24	Setting the inactivity period of pump 1 (c24=2)	1 to 30 days	days	1
t25	Setting the inactivity period of pump 2 (c24=2)	1 to 30 days	days	1
h26	Setting the day of weekly auto-test (c24=1)	1= Monday 2= Tuesday 3= Wednesday 4= Thursday 5= Friday 6= Saturday 7= Sunday	-	1
h27	Setting the hour of weekly auto-test (c24=1)	0 to 23	hour	10
h28	Setting the minutes of weekly auto-test (c24=1)	0 to 59	min	00
h29	Setting the operating time of the pump during the weekly auto-test (c24=1)	2 to 20	sec	5
CHANGE SET POINT (only for system with analogue sensor)				
c30	Setting the mode to change the set point	0= Disabled 1= Internal clock 2= From digital input DI5	-	0
r30	Setting the change value of the set point. The start and stop threshold of each pump (r08, r09, r10, r11, r12, r13) are increased and decreased by the value (c30=1)	0 to full scale	various	0.5
h30	Setting the start hour for changing the set point (c30=1)	0 to 23	hour	1
h31	Setting the start minutes for changing the set point (c30=1)	0 to 59	Min	1
h32	Setting the stop hour for changing the set point (c30=1)	0 to 23	hour	1
h33	Setting the stop minutes for changing the set point	0 to 59	min	1

	(c30=1)			
PROGRAMMING DIGITAL INPUTS (refer to figures *7* and *9*)				
r34	Setting the logic of the digital input float switch G1	1= NC, Normally closed 2= NO, Normally open	-	2
r35	Setting the logic of the digital input float switch G2	1= NC, Normally closed 2= NO, Normally open	-	2
r36	Setting the logic of the digital input float switch G MAX	1= NC, Normally closed 2= NO, Normally open	-	2
t36	Delay time until activation of digital input float switch G MAX (r36)	0 to 200	sec	0
r37	Setting the logic of the digital input float switch G MIN	1= NC, Normally closed 2= NO, Normally open	-	2
t37	Delay time until activation of digital input float switch G MIN (r37)	0 to 200	sec	0
c38	Configuration of programmable digital input D IN_PROG (1)	0= Not used. 1= External command and the pumps are switched on one at a time (2 seconds apart). 2= External alarm 3= External ON/OFF. 4= Change set point	-	0
r38	Setting the logic of programmable digital input D IN_PROG	1= NC, Normally closed 2= NO, Normally open	-	2
t38	Delay time until activation of programmable digital input D IN_PROG (r38)	0 to 200	sec	0
6CP Q-SMART MODULE (OPTION ACCESSORY), It is an electronic card with six relays and voltage-free contacts (refer to figures *7*, *9*).				
c40	Configuration of OUT_1 relay (K3 on board)	0= Disabled 1= P1 running 2= P2 running 3= Fuse 1 burned 4= Fuse 2 burned 5= High level alarm 6= Alarm Max level threshold 7= Alarm Minimum level threshold 8= External alarm 9= Auto-test in progress. 10= Alarm sensor fault 11= Power ON 12=Aut/Man mode	-	0
c41	Configuration of OUT_2 relay (K4 on board)	See configuration c40	-	0
c42	Configuration of OUT_3 relay (K5 on board)	See configuration c40	-	0
c43	Configuration of OUT_4 relay (K6 on board)	See configuration c40	-	0
c44	Configuration of OUT_5 relay (K7 on board)	See configuration c40	-	0
c45	Configuration of OUT_6 relay (K8 on board)	See configuration c40	-	0

MODBUS Q-SMART MODULE **Programming field modbus RTU RS485** (refer to figures *7* and *10*) Note: With Even or Odd parity there is a one stop bit, with no parity there are two stop bits. **Switch the Q-SMART control panel off and back on after changing the r46-c47-r47 parameters.**				
c46	Enable ModBus port communication	0= Disabled 1= Enabled	-	0
r46	Setting the address	1 to 255	-	247
c47	Parity	0= None 1= Even 2= Odd	-	2
r47	ModBus Speed	0= 9600 1= 19200 2= 38400 3= 57600	-	1
DEFAULT SETTING				
c48	Loads all the default parameters (factory setting)	0= No 1= Load default	-	0
HOUR COUNTER				
h49	Reads pump 1 operating hours	-		
h50	Reads pump 2 operating hours	-		
h51	Reads total hours of running of Q-SMART control panel	-		
c52	Resets memory of all pump hour counters	0= No 1= Reset pump 1 operating hours 2= Reset pump 2 operating hours 3= Reset pump 1 + pump 2 operating hours	-	0
PROGRAMMING THE ALARMS **(alarms dedicated to sewage application)**				
c53	Control low level	0= Disabled 1= Enabled	-	1
	(parameter available if se c02=1)			
r53	Setting probe sensitivity according to water conductivity.	5 to 100	KΩ	5
t53	Delay time until activation of probes (r53)	0 to 200	sec	0
c54	Enable alarm for minimum level threshold (only with system with sensor)	0= Disabled 1= Enabled	-	0
r54	Setting the minimum level threshold alarm	0 to Full scale sensor (0= disabled)	Various	0
t54	Delay time until activation of minimum level alarm threshold (c54=1)	0 to 200	sec	20
c55	Enable alarm for high level threshold (only with system with sensor)	0= Disabled 1=Enabled	-	0
r55	Setting the high level threshold alarm. All pumps are activated in case of alarm	0 to Full scale sensor (0= disabled)	Various	0
t55	Delay time until activation of high level alarm threshold (c55=1)	0 to 200	sec	0
SETTING SYSTEM BLOCK ALARM				
c56	Enables system block if the same alarm occurs five times in 30 min. A manual reset is necessary to restart the system	0= Disabled 1= Enabled	-	0

c57	Reset the alarm log	0= No 1= Yes	-	0

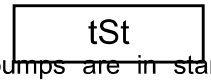
6 SPECIAL FUNCTIONS

SEWAGE APPLICATION (par. SE is selected, section *5.4.3*)

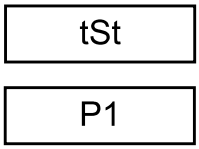
6.1 Auto-test RUN

The Auto-test function can be used to switch on the pumps when these have been turned off for a long time.
The pumps are switched ON by the clock or after a set period of inactivity (c24).

How to start the auto-test: activation by clock (c24=1)
If the pumps are running, the auto-test is put on hold and this text is shown on the display in blinking mode:



When the pumps are in standby, the auto-test starts and the test in progress and the pump in use are shown on the display in blinking mode:



How to stop the auto-test
The auto-test can be stopped at any time by pressing the OK button.

What does the auto-test do?

Auto-test activated by clock time

The Auto-test function involves the following settings and sequences:
1. Enabling the function (c24=1)
2. Setting the day, hour, minutes of the test (h26, h27, h28).
3. Switching ON pump P1 after the set time.
4. Stopping pump P1 after the set time (h29).
5. Waiting for a minute
6. Switching ON pump P2.
7. Stopping pump P2 after the set time (h29).

Auto-test activated after period of inactivity

The Auto-test function involves the following settings and sequences:
1. Enabling the function (c24=2)
2. Setting the inactivity time for Pump 1 (t24) or Pump 2 (t25).
3. Switching ON Pump P1 after the set time (t24).
4. Stopping pump P1 after the set time (h29).
5. Waiting for a minute
6. Switching ON Pump P2 after the set time (t25).
7. Stopping pump P2 after the set time (h29).

The Auto-test is interrupted if the pressure or the level in the system changes, requiring the pumps to run automatically. The Auto-test is postponed.

6.2 Starting and stopping the pumps (parameter c14)

The following description is valid when the sewage software is enabled (parameter c02=0). If lifting is enabled in the parameter (c02=1), the start and stop functions are reversed.

6.2.1 Float switches

The pumps are switched on and stopped by the float switches. Various options are provided.

0=G1 and G2
Pump 1 is switched ON and stopped by float switch G1.
Pump 2 is switched ON and stopped by float switch G2.

The high level alarm is activated by G MAX but neither of the pumps is switched ON.

1=G MIN
Pump 1 is switched ON by float switch G1.
Pump 2 is switched ON by float switch G2. Both pumps are stopped by G MIN. The high level alarm is activated by G MAX but neither of the pumps is switched ON.
The break of G MIN is diagnosed, and the pumps are switched on/stopped by G1, G2.

2=G MAX
Pump 1 is switched ON and stopped by float switch G1.
Pump 2 is switched ON and stopped by float switch G2.
The high level alarm is activated by G MAX and both pumps are switched ON. Pump 2 is switched ON after 2 sec. This option is to prevent excessive and rapid filling of the tank. The pumps are then stopped by G1, G2.
The G MIN low level float switch does not impact on the start condition of the pumps.

3=G MIN+G MAX
Pump 1 is switched ON by float switch G1.
Pump 2 is switched ON by float switch G2.
The high level alarm is activated by G MAX and both pumps are switched ON. Pump 2 is switched ON after 2 sec. This option is to prevent excessive and rapid filling of the tank.
The break of G MIN is diagnosed, and the pumps are switched on/stopped by G1, G2.
The G MIN low level float switch does not impact on the start condition of the pumps.

6.2.2 Electric probes

Pumps are switched on and stopped by electric level probes. Various options are provided.

Common probe “S COM” has to be connected.

0=S1 and S2
Pump 1 is switched ON and stopped by probe S1.
Pump 2 is switched ON and stopped by probe S2.

1=S MIN
Pump 1 is switched ON by probe S1.
Pump 2 is switched ON by probe S2.
Both pumps are stopped by probe S MIN. The high level alarm is activated by probe S MAX but neither of the pumps is switched ON.
The break of S MIN is diagnosed, and the pumps are switched on/stopped by S1, S2.

2=S MAX
Pump 1 is switched ON and stopped by probe S1.
Pump 2 is switched ON and stopped by probe S2.
The high level alarm is activated by S MAX and both pumps are switched ON. Pump 2 is switched ON after 2 sec. This option is to prevent excessive and rapid filling of the tank. The pumps are then stopped by S1, S2.
The S MIN low level probe does not impact on the start condition of the pumps.

3=S MIN+S MAX
Pump 1 is switched ON by probe S1.
Pump 2 is switched ON by probe S2.
Both pumps are switched ON by S MAX. Pump 2 is switched ON after 2 sec. The high level alarm is activated by S MAX. This option is to prevent excessive and rapid filling of the tank. Both pumps are stopped by S MIN.
The break of S MIN is diagnosed, and the pumps are switched on/stopped by S1, S2.
The S MIN low level probe does not impact on the start condition of the pumps.

7 ALARMS

SEWAGE APPLICATION (parameter SE is selected, section *5.4.3*)

List of alarms

N°	Description	Reset
A01	Fuse F1 pump 1 burned.	Auto

Troubleshooting:
Fuse 1 for pump 1 is burned.
Pump 1 affected by the fault is excluded from operation. When the fault is resolved, the pump is reactivated automatically. The intervention of the fuse automatically enables the other pump if there is the demand condition. Follow these instructions:

1. Switch OFF the panel
2. Open the front cover
3. Replace Fuse F1
4. Close the cover
5. Switch ON the panel

Causes/solutions:

- The motor of pump 1 is damaged and must be replaced.
- The power cable of the motor is faulty or worn: replace the cable.
- The capacitor of motor pump 1 is damaged and must be replaced.

N°	Description	Reset
A02	Fuse F2 pump 2 burned	Auto

Troubleshooting:
Fuse 2 for pump 1 is burned.
Pump 2 affected by the fault is excluded from operation. When the fault is resolved, the pump is reactivated automatically. The intervention of the fuse automatically enables the other pump if there is the demand condition.

Follow these instructions:
1. Switch OFF the panel
2. Open the front cover
3. Replace Fuse F1
4. Close the cover
5. Switch ON the panel

Causes/solutions:

- The motor of pump 2 is damaged and must be replaced.
- The power cable of the motor is faulty or worn: replace the cable.
- The capacitor of motor pump 2 is damaged and must be replaced.

N°	Description	Reset
A05	The sensor is faulty. In manual mode the alarm is not managed.	Auto

Troubleshooting:
The signal is below the minimum value of 3.8 mA. In case of an alarm, all pumps are stopped. The alarm will appear if the signal is below 3.8mA and it is managed only if the sensor is used (c03=2).

Causes/solutions:

- Check that the sensor and connector are connected.
- Open the cover and check that the power cord of the sensor is connected and secured to the terminals. Refer to figures *6*, *7* and *9*.
- Check that the cable of the sensor is connected correctly. Refer to figures *6*, *7* and *9*.
- The power cable of the sensor has deteriorated: replace the cable.
- The plastic connector has deteriorated: replace the connector.
- Replace the faulty sensor.

N°	Description	Reset
A36	High Level Alarm	Auto

Troubleshooting:
The level of water has reached the float switch G MAX or probe S MAX.

In sewage application (c02=0), all pumps are switched ON.
In lifting application (c02=1), all pumps are stopped.
The alarm is excluded in manual mode.

Causes/solutions
- The level has reached the position of float switch G MAX or probe S MAX if used. The pumps might not run.
- If the alarm appears but the level has not reached float switch G MAX or probe S MAX:
  - Float switch G MAX is damaged and must be replaced.
  - Probe S MAX is damaged and must be replaced.
  - The cable of the float switch is faulty or worn, replace it.
  - The cable of the probe is faulty or worn, replace it.
  - Check connection of float switch G MAX to the Q-SMART control panel terminal (refer to figures *6*, *7* and *9*).
  - Check connection of probes S MAX to the Q-SMART control panel terminal (refer to figures *6*, *7* and *9*).

N°	Description	Reset
A37	Minimum Level Alarm of the water intake tank	Auto

Troubleshooting:
Only for lifting application (c02=1)
The level of water has reached the float switch G MIN or probe S MIN. LEDs (4), (6) on.
All pumps are stopped. The alarm is excluded in manual mode.

Causes/solutions
- The level has reached the position of float switch G MIN or probe S MIN if used. Restore the water level.
- If the alarm appears but the level has not reached float switch G MIN or probe S MIN:
  - Float switch G MIN is damaged and must be replaced.
  - Probe S MIN is damaged and must be replaced.
  - The cable of the float switch G MIN is faulty or worn, replace it.
  - The cable of the probe is faulty or worn, replace it.
  - Check proper connection of the float switch G MIN to the Q-SMART control panel terminal (refer to figures *6*, *7* and *9*).

N°	Description	Reset
A39	External fault alarm Configuration of the indication of an external alarm connected to digital input D IN PROG (c38=2).	Auto

Troubleshooting:
The Alarm is detected by an external device. The logic is configured by the parameter r38. All pumps are stopped and they don't run until the alarm appears.
The alarm is excluded in manual mode.

Causes/solutions
- Check the condition of the external device and replace it if damaged.
- If an alarm appears but the device is in good condition:
  - The cable is faulty or worn, replace it.

N°	Description	Reset
A54	Minimum threshold alarm	Auto

Troubleshooting:
The level of the system does not exceed the set value of the Minimum threshold parameter (r54). After the delay time par t54 all pumps are stopped and protected against dry running.
The lifting application alarm doesn't stop the pumps, it is only an alert.
The alarm is excluded in manual mode.

Causes/solutions
- No water on the intake side of the pump: check the level.
- The pump (impeller or diffuser) is damaged. Contact the technical assistance service.
- The motor doesn't run:
  - It is damaged and must be replaced. Contact the technical assistance service.
  - The thermal protector inside the motor is faulty or broken.
  - The capacitor is broken.

N°	Description	Reset
A55	Max threshold alarm	Auto

Troubleshooting:
The level of the system exceeds the set value of the Maximum threshold parameter (r55).
After the delay time par t55, all the pumps are switched on for the sewage application (c02=0).
After the delay time par t55, all the pumps are stopped for the lifting application (c02=1)
The alarm is excluded in manual mode.

Causes/solutions
- The water has exceeded the max level: check the level.
- The pump (impeller or diffuser) is damaged. Contact the technical assistance service.
- The motor doesn't run:
  - It is damaged and must be replaced. Contact the technical assistance service.
  - The thermal protector inside the motor is faulty or broken.
  - The capacitor is broken.

N°	Description	Reset
A56	The same alarm is detected 5 times in the last 30 minutes	Manual

Troubleshooting:
The system is blocked because the same alarm is detected 5 times in the last 30 minutes. Use parameter c57 to reset and restart the system.
Causes/solutions

- Identify the type of alarm and resolve it.

Tab 3 BOOSTER APPLICATION
(parameter bS is selected, section *5.4.3*)

Par.	Description	Range	Unit	Default
SYSTEM				
c01	Number of pumps	1= 1 pump 2= 2 pumps	-	depending on the control panel model
c02	Jockey pump. The jockey pump will stay on if the second pump P2 runs.	0= Disabled 1= Enabled	-	0
c03	Type of sensor or control device.	1= Pressure sensor 2= Temperature sensor 3= Level sensor 4= Pressure switch 5= Probes 6= Pressure sensor with automatic activation of the pressure switches if sensor is faulty.	-	1
c04	Sensor signal type	1= 4-20mA 2= 0-20mA	-	1
c05	Initial scale value of the sensor. Only if sensor is used.	Pressure: 0-60 bar Temperature: -20 to 100 °C Level 0 to 50 m	various	0
r05	Calibration of the initial scale in mA.	0= Disabled 1= Enabled	-	0
t05	Software filter for analogue input	Standard Lowara	-	3
c06	Full scale value of the selected sensor. Only if sensor is used.	Pressure: 0-60 bar Temperature: -20 to 100 °C Level: 0 to 50 m	Various	10.0
THRESHOLD AND TIMING (threshold is active only with analogue sensor)				
c07	Unique pressure set point	0= Disabled 1= Enabled	-	0
r07	Set point pressure value	0 to Full Scale	Various	3.5
r08	Upper threshold delta	0 to Full Scale	Various	0.5
r09	Lower threshold delta	0 to Full Scale	Various	0.5
r10	Threshold Start Pump 1	0 to Full Scale	Various	2.7
t10	Delay time start Pump 1	0 to 100	sec	0
r11	Threshold Stop Pump 1	0 to Full Scale	Various	3.5
t11	Delay time stop Pump 1	0 to 100	sec	0
r12	Threshold Start Pump 2	0 to Full Scale	Various	2.6
t12	Delay time start Pump 2	0 to 100	sec	2
r13	Threshold Stop Pump 2	0 to Full Scale	Various	3.4
t13	Delay time stop Pump 2	0 to 100	sec	0.3
LOAD LOSS COMPENSATION **Available only for systems with an analogue sensor.** For a description see section *8.2*.				
r14	Enable load loss compensation with increase of the start and stop thresholds, in bar, for the pumps after the first one.	0 to full scale 0= Disabled	-	0
PUMPS SWITCHOVER				
c15	Enable pump rotation. Auto-	0= Disabled 1= Enabled	-	1

	matic pump rotation takes place each time the set is restarted after stopping in automatic mode.			
c16	Insert the duty pump that you want to start first after powering up of the set or after reset. Parameter c15 is enabled. If Jockey pump is installed (c02=1) the first pump is default P1.	1= Pump 1 2= Pump 2	-	1
c17	If automatic pump rotation does not take place (the system has never been able to stop), after the set time a “forced” rotation of the duty pumps is performed.	0= Disabled 1 to 12 hours	Hours	0
c18	Settable only for system with sensor. Halves the timing (t10, t11, t12, t13) in the case of excessive variation of the feedback (pressure, levels, temperature).	0= Disabled 1= Enabled	-	0
REAL TIME CLOCK				
h19	Setting the date	Y	-	
h20	Setting the month	M= 1 to 12	-	
h21	Setting the day	d= 1 to 31	-	
h22	Setting the hour	h= 0 to 23	-	
h23	Setting the minute	m= 00 to 59	-	
AUTO-TEST RUN With this function, the pumps are started once per week and at a set time and day. For a description see section *8.1*.				
c24	Enabling periodic Auto-test	0= Disabled 1= Weekly	-	0
t25	Setting the inactivity period of pump 2 (c24=2)	1 to 30 days	days	1
h26	Setting the day of weekly auto-test (c24=1)	1= Monday 2= Tuesday 3= Wednesday 4= Thursday 5= Friday 6= Saturday 7= Sunday	-	1
h27	Setting the hour of weekly auto-test (c24=1)	0 to 23	hour	10
h28	Setting the minutes of weekly auto-test (c24=1)	0 to 59	min	00
h29	Setting the operating time of the pump during the weekly auto-test (c24=1)	0 to 300	sec	60
CHANGING THE SET POINT (only for system with analogue sensor)				
c30	Setting the mode to change the set point	0= Disabled 1= Internal clock 2= With programmable digital input D IN_PROG	-	0
r30	Setting the value for	0 to full scale	various	0.5

	changing the set point. The start and stop threshold of each pump (r08, r09 10, r11, r12, r13) are increased and decreased by the value (c30=1)			
h30	Setting the start hour for changing the set point (c30=1)	0 to 23	hour	1
h31	Setting the start minutes for changing the set point (c30=1)	0 to 59	Min	1
h32	Setting the stop hour for changing the set point (c30=1)	0 to 23	hour	1
h33	Setting the stop minutes for changing the set point (c30=1)	0 to 59	min	1
PROGRAMMING THE DIGITAL INPUTS (refer to figures *7*, *9*)				
r34	Setting the logic of the digital input of pressure switch P1	1= NC, Normally closed 2= NO, Normally open	-	1
r35	Setting the logic of the digital input of pressure switch P2	1= NC, Normally closed 2= NO, Normally open	-	1
r36	Setting the logic of the digital input high pressure switch P MAX	1= NC, Normally closed 2= NO, Normally open	-	1
t36	Delay time until activation of the digital input high pressure switch P MAX (r36)	0 to 200	sec	0
r37	Setting the logic of the digital input minimum pressure switch P MIN	1= NC, Normally closed 2= NO, Normally open	-	1
t37	Delay time until activation of the digital input minimum pressure switch P MIN (r37)	0 to 200	sec	0
c38	Configuration of the programmable digital input D IN_PROG[1]	0= Not used. 1= Membrane pressure switch. 2= External alarm 3= External ON/OFF. 4= Change set point	-	0
r38	Setting the logic of programmable digital input D IN_PROG	1= NC, Normally closed 2= NO, Normally open	-	1
t38	Delay time until activation of the programmable digital input D IN_PROG (r38)	0 to 200	sec	0
6CP Q-SMART MODULE (OPTIONAL ACCESSORY), It is an electronic card with six relays and voltage-free contacts (refer to figures *7* and *9*).				
c40	Configuration of the OUT_1 relay (K3 on board)	0= Disabled 1= P1 running 2= P2 running 3= Fuse 1 burned 4= Fuse 2 burned 5= Lack of water alarm 6= Maxi-	-	0

		mum pressure threshold alarm. 7= Minimum pressure threshold alarm. 8= External alarm 9= Command for Auto-test 10= Auto-test faulty 11= Power ON 12=Aut/Man mode		
c41	Configuration of the OUT_2 relay (K4 on board)	See configuration c40	-	0
c42	Configuration of the OUT_3 relay (K5 on board)	See configuration c40	-	0
c43	Configuration of the OUT_4 relay (K6 on board)	See configuration c40	-	0
c44	Configuration of the OUT_5 relay (K7 on board)	See configuration c40	-	0
c45	Configuration of the OUT_6 relay (K8 on board)	See configuration c40	-	0
MODBUS Q-SMART MODULE **Programming the field modbus RTU RS485** (refer to figures *7* and *10*) Note: With Even or Odd parity there is one stop bit, with no parity there are two stop bits.				
c46	Enable ModBus port communication	0= Disabled 1= Enabled	-	0
r46	Setting the address	1 to 255	-	247
c47	Parity	0= None 1= Even 2= Odd	-	2
r47	ModBus Speed	0= 9600 1= 19200 2= 38400 3= 57600	-	1
DEFAULT SETTING				
c48	Loads all the default parameters (factory setting)	0= No 1= Load default	-	0
HOUR COUNTER				
h49	Reads pump 1 operating hours	-		
h50	Reads pump 2 operating hours	-		
h51	Reads total hours of power of control panel Q-SMART	-		
c52	Resets memory of the hour counter for all pumps	0= No 1= Reset pump 1 operating hours 2= Reset pump 2 operating hours 3= Reset pump 1 + pump 2 operating hours	-	0
PROGRAMMING THE ALARMS **(alarms dedicated to sewage application)**				
c53	Lack of water alarm. Protection against dry running of the pump	0= Disabled 1= Enabled	-	1
r53	Setting probe sensitivity according to water conductivity.	5 to 100	KΩ	5
t53	Delay time until activation of lack of water alarm (c53)	0 to 200	sec	0
c54	Enable	0= Disa-	-	0

	alarm for minimum pressure threshold (only for system with sensor)	bled 1= Enabled		
r54	Setting the minimum pressure threshold	0 to Full scale sensor (0= disabled)	Various	0
t54	Delay time until activation of minimum pressure alarm threshold (c54=1)	0 to 200	sec	20
c55	Enable alarm for maximum pressure threshold alarm (only for system with sensor)	0= Disabled 1= Enabled	-	0
r55	Setting the maximum pressure threshold alarm. All pumps are stopped in case of alarm	0 to Full scale sensor (0= disabled)	Various	0
t55	Delay time until activation of maximum pressure alarm threshold (c55=1)	0 to 200	sec	0
SETTING SYSTEM ALARM BLOCK				
c56	Enables system block if the same alarm occurs five times in 30 min. A manual reset is necessary to restart the system.	0= Disabled 1= Enabled	-	0
c57	Reset the alarm log	0= No 1= Yes	-	0

(1) D IN PROG=1 is set
(Minimum pressure out of operation range is detected)

If the pressure switch is activated in automatic mode and not during Auto-test, the following happens:
- If the pumps are running they will not be stopped and alarm A38 will be shown.
- If the pumps are not running they will not start and alarm A38 will be shown. If there is a pressure drop, however, they will be switched on and alarm A38 continues to be shown.

If the minimum pressure is activated during the Auto-test, see section *8.1*.

8 SPECIAL FUNCTION

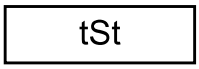
BOOSTER APPLICATION (parameter bS is selected, see section *5.4.3*)

8.1 Auto-test RUN

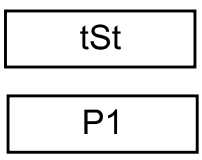
Using the Auto-test function, the pumps can be switched ON when they have been OFF for a long time.
The pumps are switched ON by the clock or by an external digital contact (c24).

NOTICE:
The following components have to be used:
- Solenoid valve: it is required to drain the water during the test.
- Membrane pressure switch or equivalent device. It is used to check the performance of the pump to prevent its value from dropping too low. It is connected to D IN PROGR of the Q-SMART control panel (refer to figures *7* and *9*)
- Q-SMART-6FVC MODULE, electronic card relay voltage-free contacts (refer to figures *7* and *9*)

How to start the auto-test: activation by clock (c24=1)
If the pumps are running, the auto-test is put on hold and this text is shown on the display in blinking mode:



When the pumps are in standby, the auto-test starts and the test in progress and the pump in use are shown on the display in blinking mode:



How to stop the auto-test
The auto-test can be stopped at any time by pressing the OK button.

What does the Auto-test Run do?

Auto-test activated by clock time

The Auto-test function involves the following settings and sequences:

1. Enabling the function (c24=1)
2. Setting the day, hour, minutes of the test (h26, h27, h28).
3. Setting the programmable digital input D IN PROGR (c38=1)
4. Setting the relay of the 6CP Q-SMART MODULE, c40=9, Command for Auto-test.
5. Setting the relay of the 6CP Q-SMART MODULE, c40=10, Auto-test faulty.
6. At the scheduled time, switching ON Pump P1 after the solenoid valve is opened.
7. Stopping pump P1 after the set time (h29).
8. Waiting for a minute
9. Switching ON pump P2.
10. Stopping pump P2 after the set time (h29).

The Auto-test is interrupted in the following conditions:

- The membrane pressure switch is activated (performance of pump is too low). Alarm A24 or A25 is triggered. The dedicated relay of the 6CP Q-SMART MODULE will be activated. The buzzer of the Q-SMART control panel is also activated and the set resumes working in automatic mode. Press button (4), figure *1*, to silence the buzzer.
- If the pressure or level in the system changes, the set resumes working in automatic mode. The Auto-test is postponed.

8.2 LOAD LOSS COMPENSATION (cr14)

Sometimes there is a pressure drop in the system due to losses in the pipes which increase when the demand for water increases.

To compensate for loss of load, it is possible to enable a control that supplies pressure proportional to the load. A direct measurement of the flow is not taken, but it is assumed that it is proportional to the number of pumps running.
When each duty pump after the first is started, the UPPER and LOWER thresholds are increased by the value indicated by parameter r14. The jockey pump is excluded.

9 ALARMS

BOOSTER APPLICATION (parameter bS is selected, section *5.4.3*)

List of alarms

N°	Description	Reset
A01	Fuse F1 pump 1 burned.	Auto

Troubleshooting:
Fuse 1 for pump 1 is burned.
Pump 1 affected by the fault is excluded from operation. When the fault is resolved, the pump is reactivated automatically. Intervention of the fuse automatically enables the other pump if there is demand condition.

Causes/solutions:

- The motor of pump 1 is damaged and must be replaced.
- The power cable of the motor is faulty or worn: replace the cable.
- The capacitor of the motor for pump 1 is damaged and must be replaced.

N°	Description	Reset
A02	Fuse F2 pump 2 burned	Auto

Troubleshooting:
Fuse 2 for pump 1 is burned.
Pump 2 affected by the fault is excluded from operation. When the fault is resolved, the pump is reactivated automatically. Intervention of the fuse automatically enables the other pump if there is demand condition.

Causes/solutions:

- The motor of pump 2 is damaged and must be replaced.
- The power cable of the motor is faulty or worn: replace the cable.
- The capacitor of the motor for pump 2 is damaged and must be replaced.

N°	Description	Reset
A05	The sensor is faulty. The alarm is not managed in manual mode.	Auto

Troubleshooting:
Signal below the minimum value of 3.8 mA. In the case of an alarm, all the pumps are stopped. The alarm will appear if the signal is below 3.8mA and it is managed only if the sensor is used (c03=2).
The alarm is excluded in manual mode.

Causes/solutions:

- Check that the sensor and connector are connected.
- Open the cover and check that the power cord of the sensor is connected and secured to the terminals. Refer to figures *6*, *7* and *9*.
- Check if the cable of the sensor is connected correctly. Refer to figures *6*, *7* and *9*.
- The power cable of the sensor has deteriorated: replace the cable.
- The plastic connector has deteriorated: replace the connector.
- Replace the faulty sensor.

N°	Description	Reset
A24	Auto-test pump 1 failed	Auto

Troubleshooting:

The Auto-test of pump 1 has failed. The test is stopped due to intervention of the membrane pressure switch connected to the D IN PROG (c38=1). The pressure in delivery side achieves the setting of the pressure switch.

Causes/solutions
- The pump (impeller or diffuser) is damaged. Contact the technical assistance service.
- The motor pump 1 doesn't run:
  - It is damaged and must be replaced. Contact the technical assistance service.
  - The thermal protector inside the motor is faulty or broken.
  - The capacitor is damaged.

N°	Description	Reset
A25	Auto-test pump 2 failed	Auto

Troubleshooting:
The Auto-test of pump 2 has failed. The test is stopped due to intervention of the membrane pressure switch connected to the D IN PROG (c38=1). The pressure in delivery side achieves the setting of the pressure switch.

Causes/solutions
- The pump (impeller or diffuser) is damaged. Contact the technical assistance service.
- The motor doesn't run:
  - It is damaged and must be replaced. Contact the technical assistance service.
  - The thermal protector inside the motor is faulty or broken.
  - The capacitor is damaged.

N°	Description	Reset
A36	High pressure alarm	Auto

Troubleshooting:
The pressure value has reached the set value of the high pressure switch P MAX.
All the pumps are stopped.

The alarm is excluded in manual mode.

Causes/solutions
- The pressure has reached the set value of the high pressure switch P MAX: check the pump performance curve and the proper set point (r07) or thresholds of the pumps (r11, r13).
- If the alarm appears but the pressure value does not reach the value of the pressure switch P MAX:
  - The maximum pressure switch must be replaced.
  - The cable of the pressure switch is faulty or worn, replace it.
  - Check connection of the pressure switch P MAX to the Q-SMART control panel terminal (see figures *6*, *7* and *9*).
  - The pressure switch P MAX is damaged, replace it.

N°	Description	Reset
A37	Minimum pressure alarm	Auto

Troubleshooting:
The pressure value has reached the set value of the minimum pressure switch P MIN. LEDs (4), (6) on.
All the pumps are stopped.

The alarm is excluded in manual mode.

Causes/solutions
- The pressure has reached the set value of the minimum pressure switch P MIN. Check the pump performance curve and the proper set point (r07) or thresholds of the pumps (r10, r12).
- If the alarm appears but the pressure value has not reached the set value of the pressure switch P MIN:
  - The pressure switch P MIN is damaged and must be replaced.
  - The cable of the pressure switch is faulty or worn, replace it.
  - Check connection of the pressure switch P MIN to the Q-SMART control panel terminal (refer to figures *6*, *7* and *9*).
- The pump (impeller or diffuser) is damaged. Contact the technical assistance service.
- The motor doesn't run:
  - It is damaged and must be replaced. Contact the technical assistance service.
  - The thermal protector inside the motor is faulty or broken.
  - The capacitor is broken.

N°	Description	Reset
A38	Minimum pressure out of operation range.	Auto

Troubleshooting:
Tripping of the protection against operation of the pump below the minimum pressure. The signal arrives from the minimum pressure switch connected to the digital input D IN PROG (c38=1). If it appears during normal operation instead of during the auto-test phase, all the pumps are enabled in order after the set delay time (t38) to restore the pressure.

Causes/solutions
- There is an alarm but the pumps are stopped:
  - The pressure switch is faulty or its cable is damaged. Replace the pressure switch or cable.
  - Incorrect setting of the pressure switch, change it.
- There is an alarm but the pumps are running:
  - The pressure switch is faulty or its cable is damaged. Replace the pressure switch or cable.

- The pumps cease to perform: the impeller is broken.
- Wrong selection of pump: change the pump.

- The motor doesn't run:
  - It is damaged and must be replaced. Contact the technical assistance service.
  - The thermal protector inside the motor is faulty or broken.
  - The capacitor is broken.

N°	Description	Reset
A39	External fault alarm Configuration of the indication of an external alarm connected to digital input D IN PROG (c38=2).	

Troubleshooting:
The Alarm is detected by an external device. The logic is configured by the parameter r38. All pumps are stopped and they don't run until the alarm appears.
The alarm is excluded in manual mode.

Causes/solutions
- Check the condition of the external device, replace it if it is damaged.
- If an alarm appears but the device is in good condition:
  - The cable is faulty or worn, replace it.

N°	Description	Reset
A53	No flow of water to the pump alarm.	Auto

Troubleshooting:

No flow of water from probe circuit alarm. The water level at the suction of the pump or the pressure set is below the minimum level. All the pumps are stopped and protected against dry running. LEDs (4), (6) on.
The alarm is excluded in manual mode.

N°	Description	Reset
A54	Minimum threshold alarm	Auto

Troubleshooting:

The pressure of the system does not exceed the set value of the Minimum threshold parameter (r54). After the delay time par t54 all the pumps are stopped and protected against dry running.
The alarm is excluded in manual mode.

Causes/solutions
- The pump (impeller or diffuser) is damaged. Contact the technical assistance service.
- The motor doesn't run:
  - It is damaged and must be replaced. Contact the technical assistance service.
  - The thermal protector inside the motor is faulty or broken.
  - The capacitor is broken.

N°	Description	Reset
A55	Max threshold alarm	Auto

Troubleshooting:
The pressure of the system exceeds the set value of the Maximum threshold parameter (r55).
After the delay time par t55 all the pumps are stopped.

The alarm is excluded in manual mode.

Causes/solutions
- The pressure has exceeded the max pressure: check the set value (r55).
- Wrong pump selection: replace the pump.

N°	Description	Reset
A56	The same alarm is detected 5 times in the last 30 minutes	Manual

Troubleshooting:
The system is blocked because the same alarm is detected 5 times in the last 30 minutes. Use parameter c57 to reset and restart the system.

Causes/solutions
- Identify the type of alarm and resolve it

10 SYSTEM SETUP AND OPERATION

10.1 Parameters to check upon startup

Check the following programming parameters upon startup.

1. Define the installation and proper control devices (sensor, digital inputs):
   - 1 or 2 pressurisation pumps; refer to Figures 17 to 38 and 47 to 53.
   - 1 or 2 sewage or filling pumps; refer to Figures 11 to 16, 39 to 46 and 54 to 64.
2. Connect the sensor and/or digital input to the proper terminals. Refer to figures *7*, *8* and *9*.
3. **During switch on: Select the section software *5.4.3* and the type of sensor**
   - **sewage or filling pump = sE software.**
   - **booster pump = bS software.**
   - **P= pressure switch**
   - **S: electronic sensor**
   - **G: float switch**
4. Set the parameters in the parameter menu according to the type of application and pump:
   - sewage or lifting pump (sE software), see *Tab 2*.
   - booster pump (bS software), see *Tab 3*.

11 MAINTENANCE

Precaution

WARNING:

- Observe the accident prevention regulations in force.
- Use suitable equipment and protective devices.
- Always refer to the local regulations, legislation and codes in force regarding the selection of the installation site, plumbing and power connection.

11.1 General maintenance

Electrical hazard
Before any servicing or maintenance, disconnect the system from the power supply and wait at least 2 minutes before starting work on or in the unit.
Turn off and unplug the system before installing the unit or carrying out maintenance.

- The Q-SMART control panel does not require any routine maintenance when used within the limits that are indicated in the
- *Technical* data.
- It is advisable to periodically check correct triggering of the high sensitivity differential switch (30 mA) [RCD, residual current device] suited to the ground fault current.

12 Troubleshooting

Introduction
In addition to the alarm troubleshooting guide in the List of alarms (sections *7* and *9*), we also provide a guide for troubleshooting other possible problems.

12.1 Faults, causes, and remedies

The pump does not run, the main switch is on.

Cause	Solution
No power supply	Restore the power supply and check that the mains connection is intact.
Triggered overload Circuit breaker	Reset the overload circuit breaker.
Triggered ground fault protective device.	Reset the differential protection.
Fuse F1 or F2 is faulty.	Replace the fuse.
The motor capacitor is faulty.	Replace the capacitor if it is an external one. Contact the local sales and service representative if it is an internal capacitor.

The pump starts up but blows the converter fuse

Cause	Solution
Damaged power cable, short circuited motor, or the thermal protector or fuses are not suited to the motor current.	Check and replace the components as necessary.
Triggered thermal overload switches on single-phase motors due to excessive current input.	Check the operating conditions of the pump.

The utilities are closed and the electric pump runs at intermittent speeds

Cause	Solution
Water leaking out of the non-return valve or out of the system.	Check the system to locate the leaks. Repair or replace the components.
Diaphragm tank with broken diaphragm, when applicable.	Replace the diaphragm.
Operating point is not calibrated correctly in relation to the system. For example, the value is higher than the pressure supplied by the pump.	Recalibrate the threshold and timing.
There could be a problem with the level float in the intake tank.	Check the float and the tank.
There could be a problem with the level float in the intake tank.	Check the pressure switch and the intake conditions (pressure).

The pump runs and there are vibrations in or near the pump.

Cause	Solution
The operating point is not calibrated correctly in relation to the system. The value is below the minimum pressure that is supplied by the pump.	Recalibrate the threshold and timing.

The pump always runs at maximum speed.

Cause	Solution

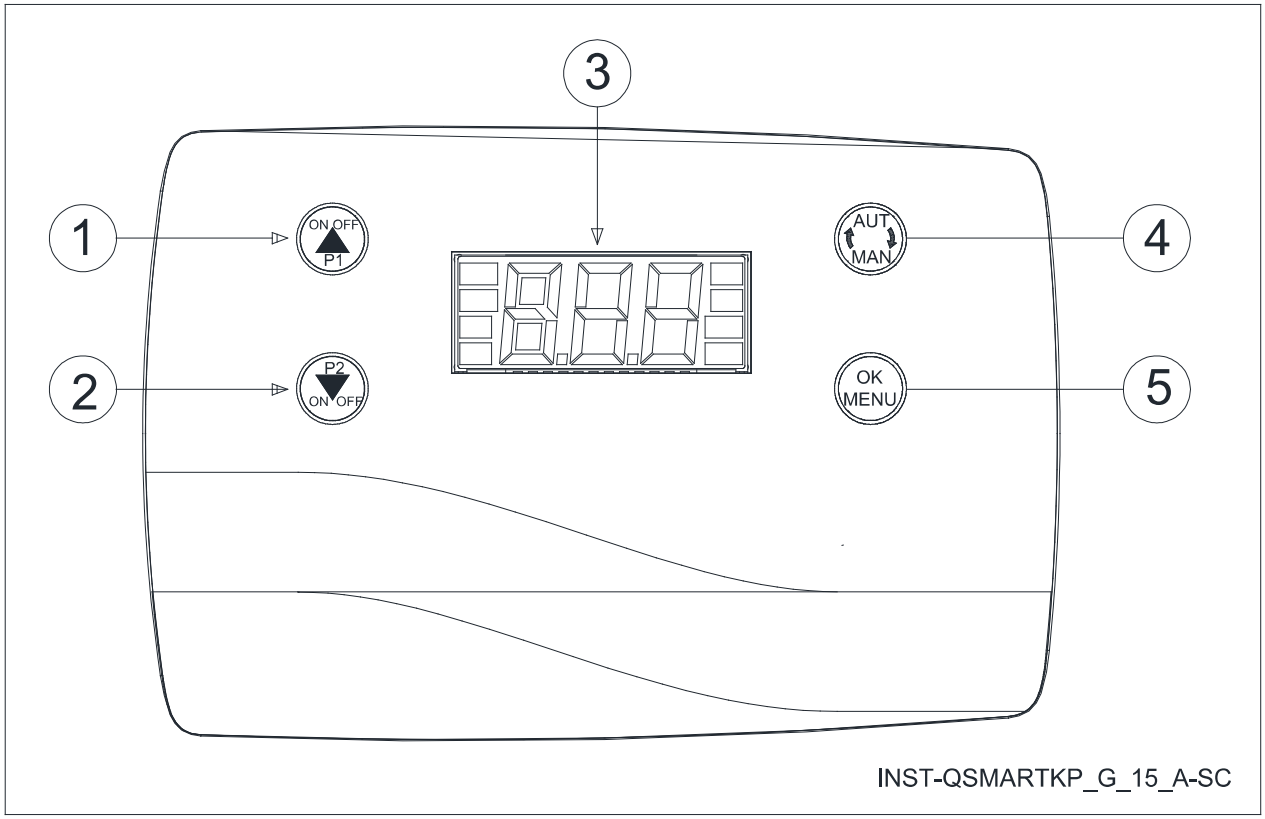
There could be a problem with the Sensor.	Check the hydraulic connection between the sensor and the system. Check the working order of the sensor. There is air in the sensor or the hydraulic circuit concerned.
Threshold too high and the pump does not reach the required value.	Change the threshold.
The pump is not primed.	Check the suction line and priming of the pump.

The main protective device of the system is triggered.

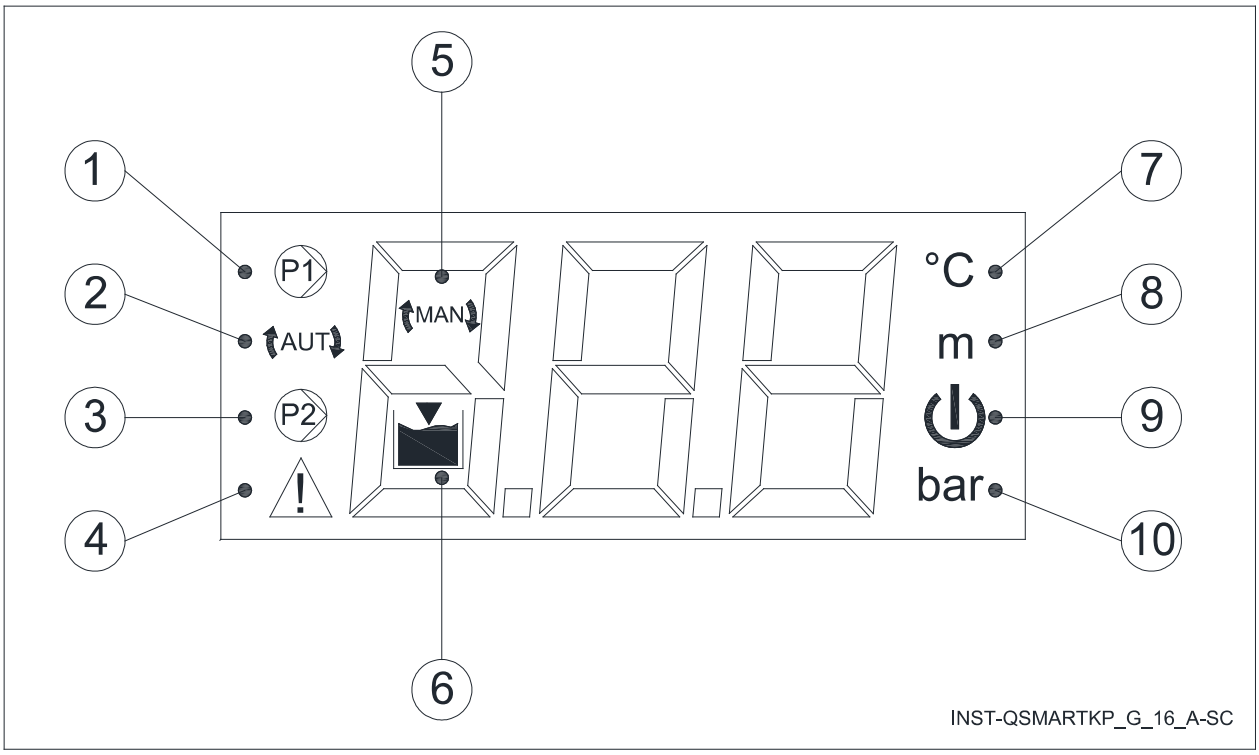
Cause	Solution
Short circuit	Check the connecting cables.
In the case of a single-phase pump, the motor capacitor is faulty.	Replace the capacitor if it is an external one. Contact the local sales and service representative if it is an internal capacitor.

APPENDICE • APPENDIX • ANNEXE • ANHANG • APÉNDICE • ANEXO • BIJLAGE • ZAŁĄCZNIK • ΠΑΡΆΡΤΗΜΑ • EK • ПРИЛОЖЕНИЕ • ملحق

1.



2.



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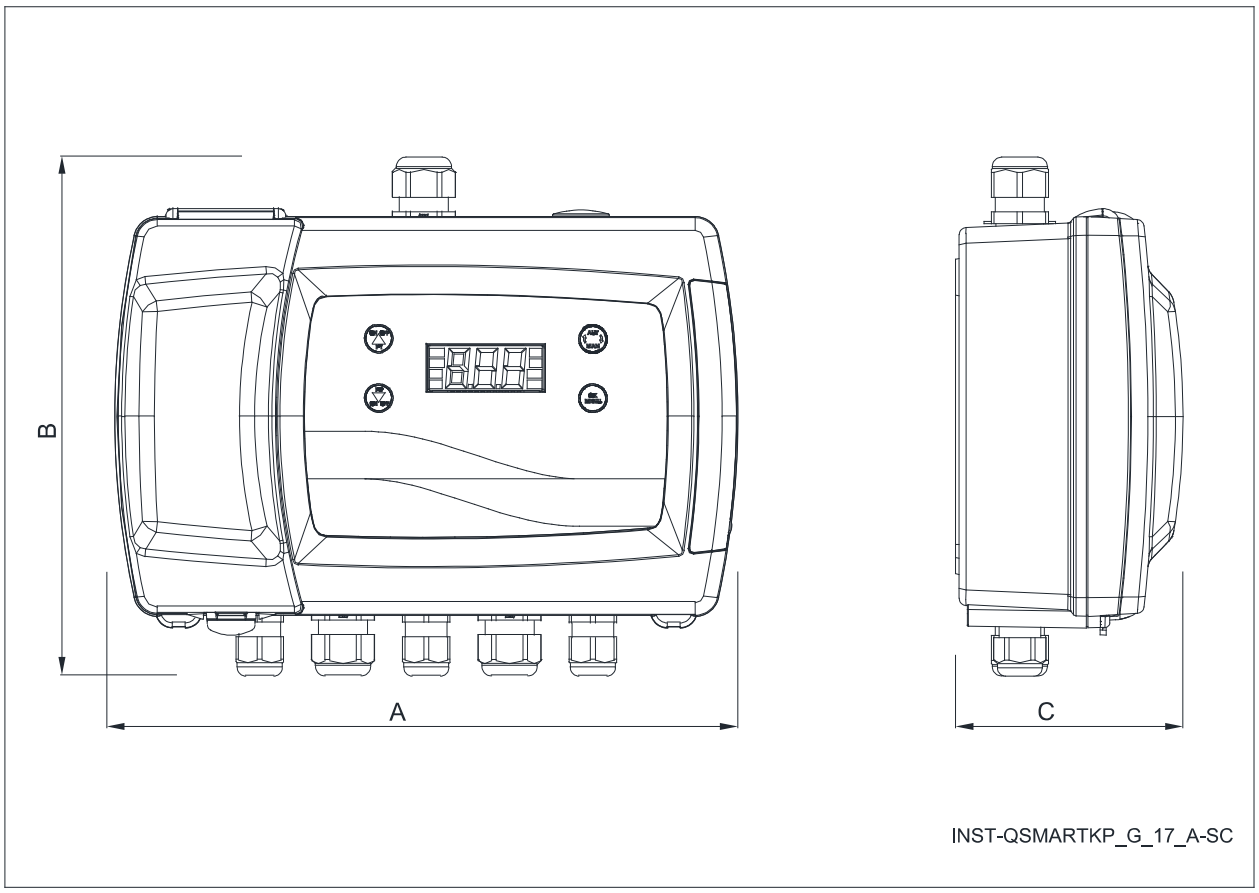
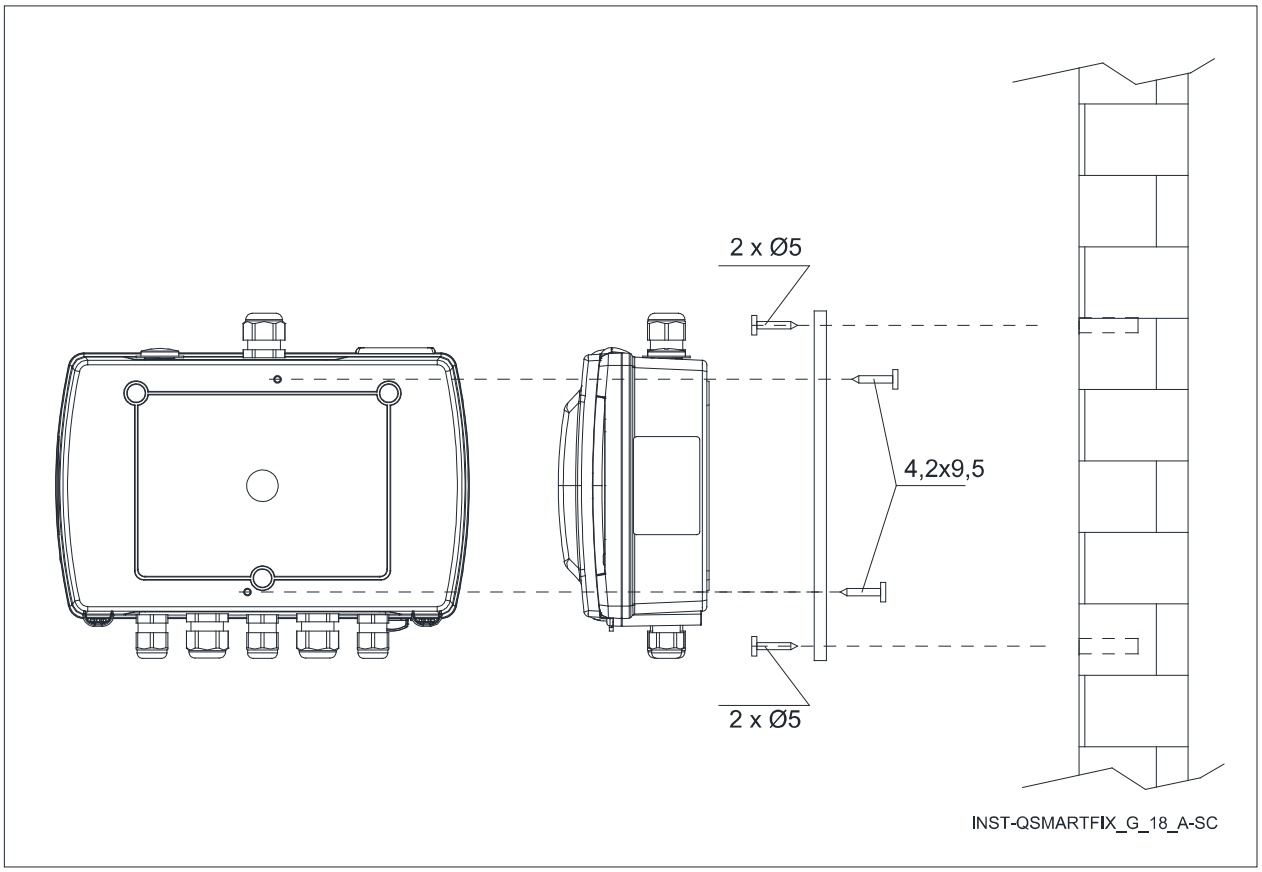
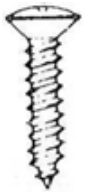


Model	A [mm]	B[mm]	C [mm]	kg
Q-SMART 10	262	218	95,6	1,55
Q-SMART 20	262	218	95,6	1,65

4.

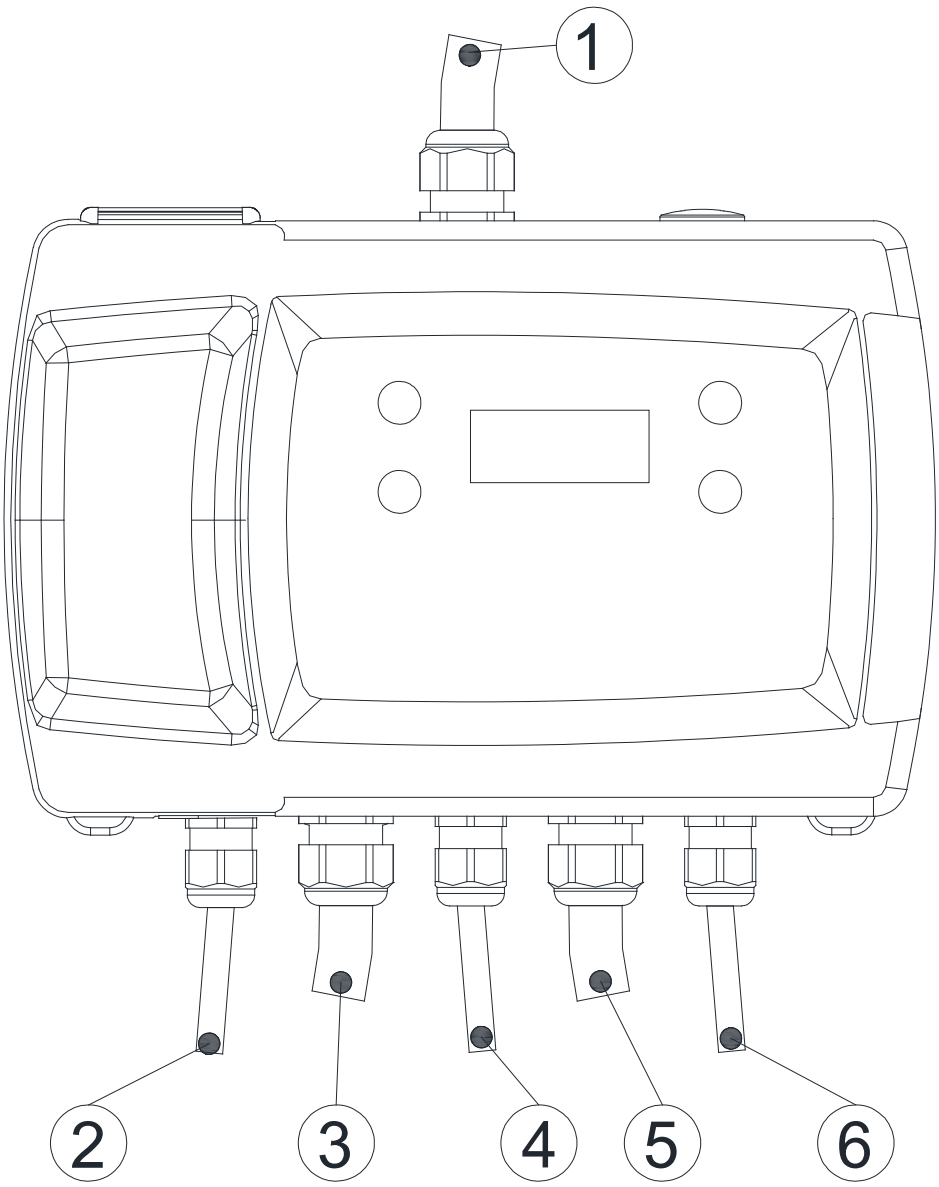


Tab 4
4. Sekme
Табл. 4

							
	M	M	M	M	M		
	16	20	16	20	20		
	5 - 10 mm	7 - 13 mm					M4,2X9,5
Q-SMART 10	3	3	2	1	1	1	2
Q-SMART 20	3	3	2	1	1	1	2

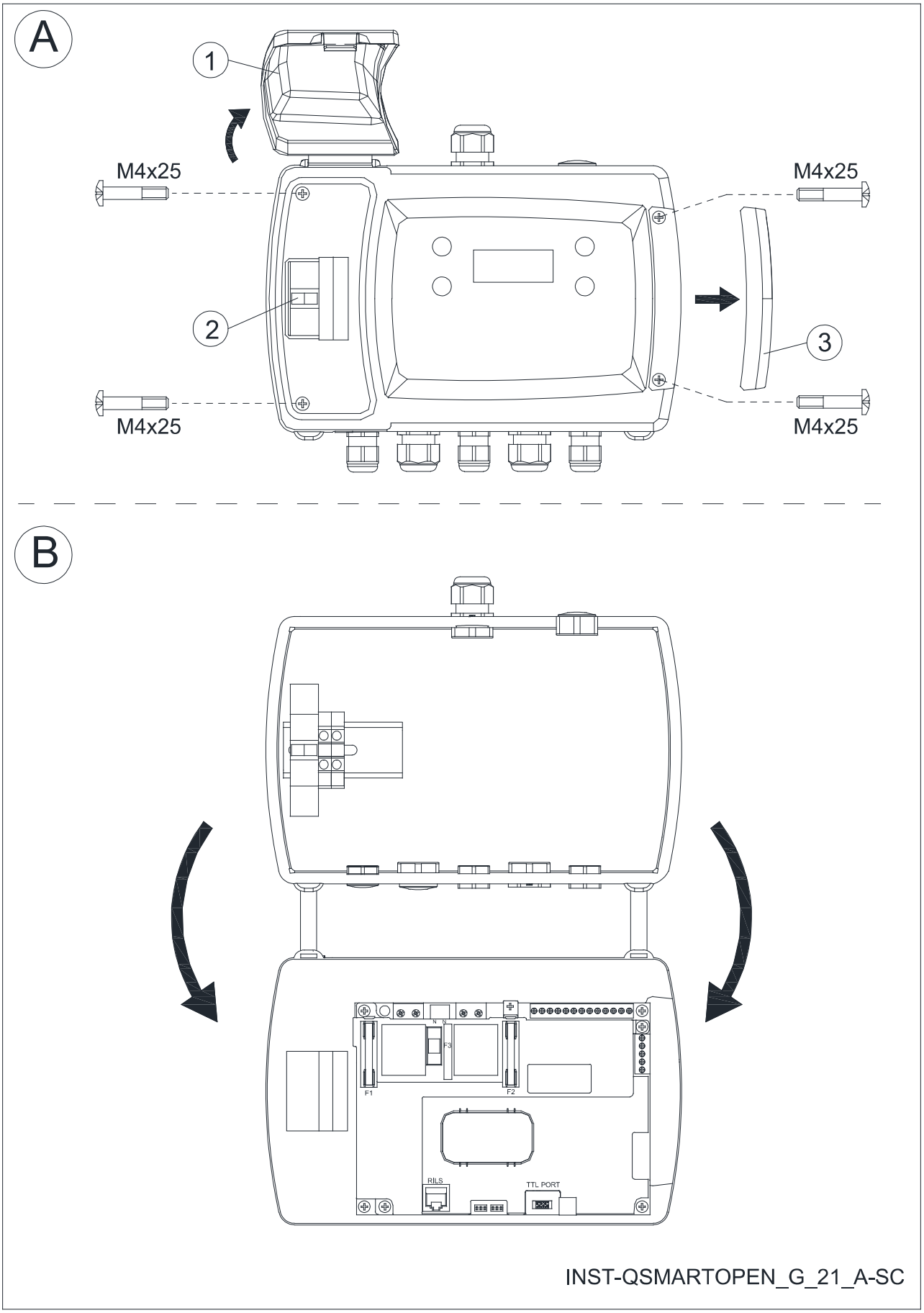
TABCOMP_QSMART_A_SC

5.

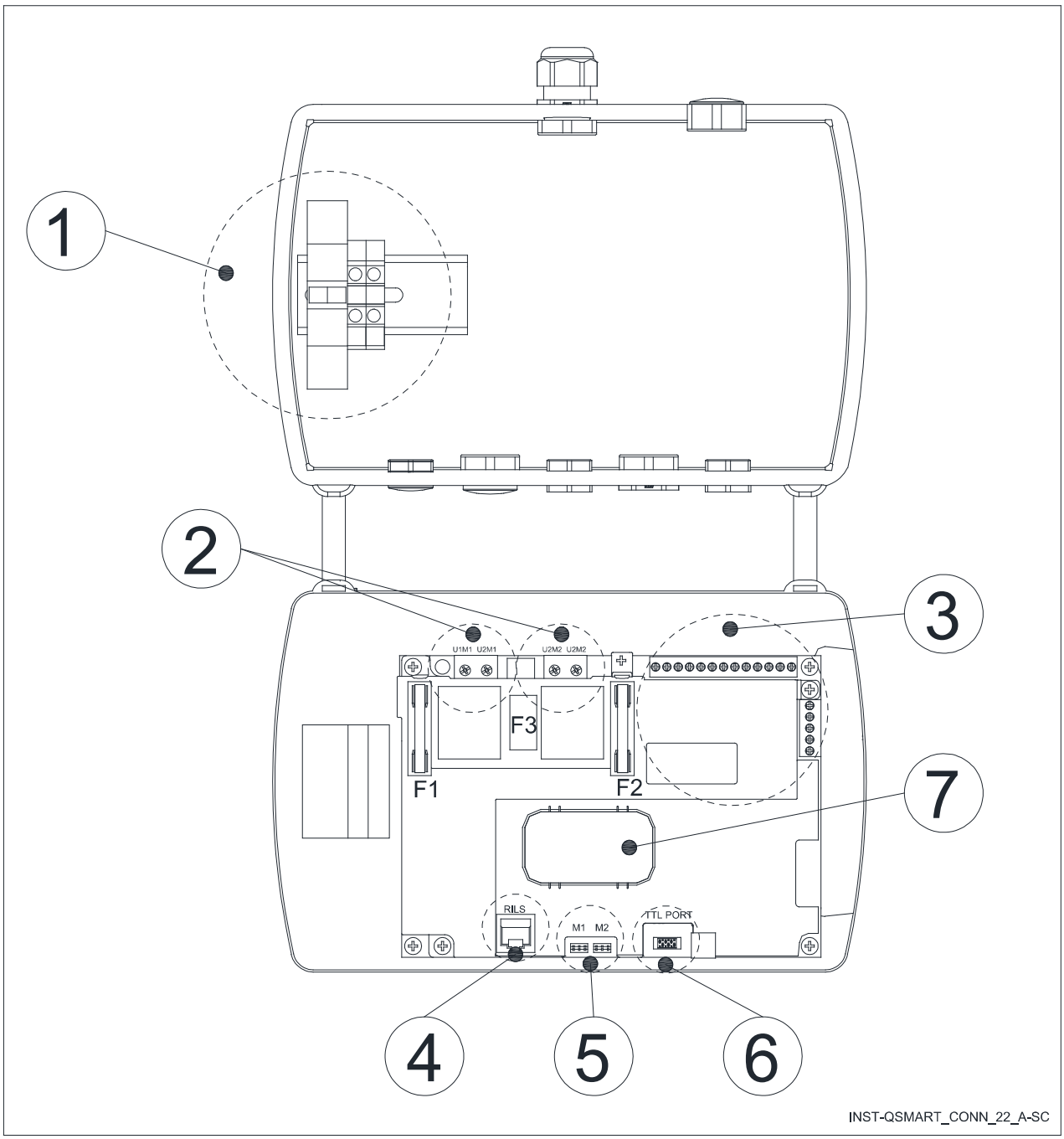


INST-QSMARTCAVI_G_22_A-SC

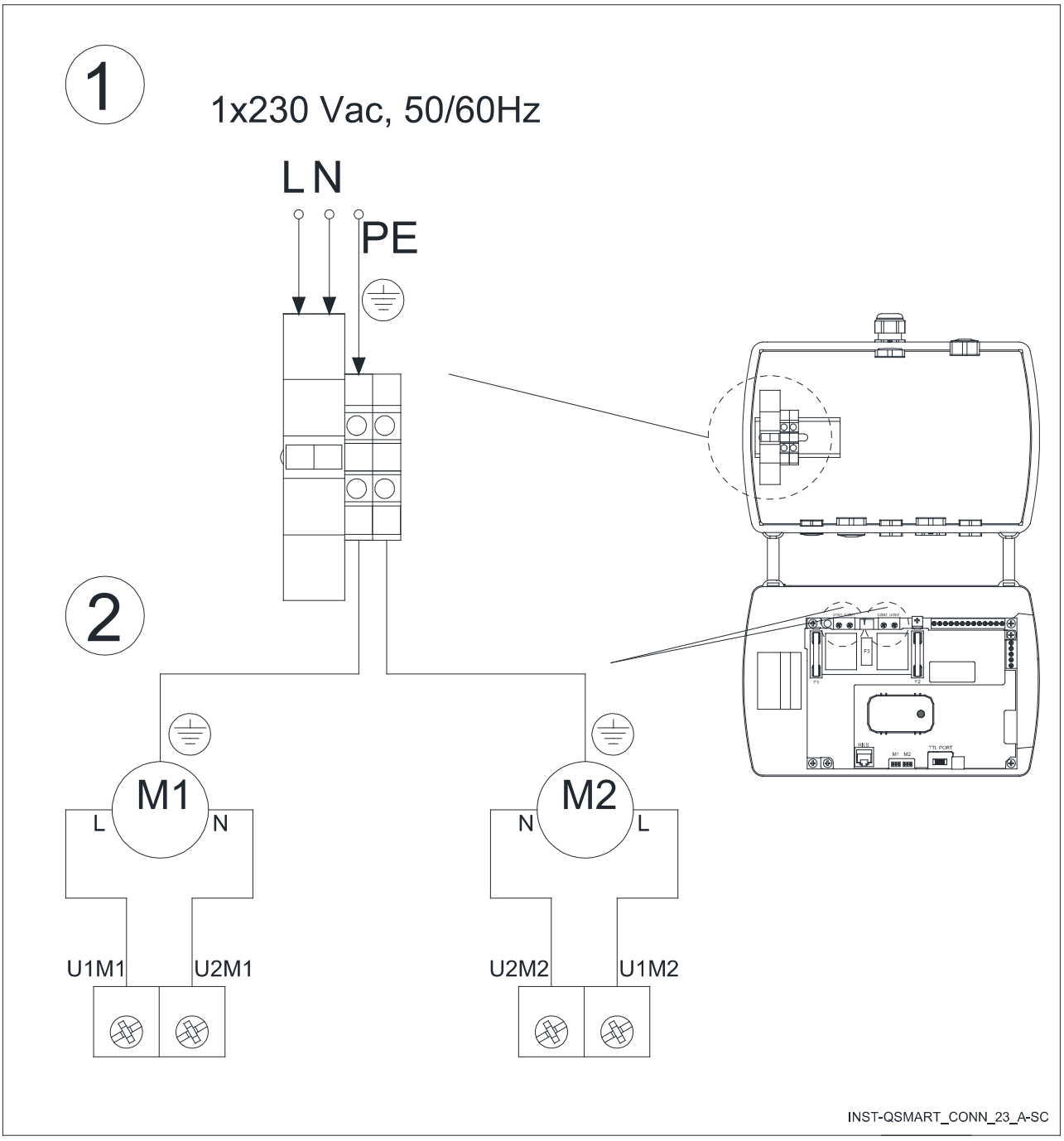
6.


A
1
2
3
M4x25
M4x25
M4x25
M4x25
B
F1
F2
F3
RILS
TTL PORT
INST-QSMARTOPEN_G_21_A-SC

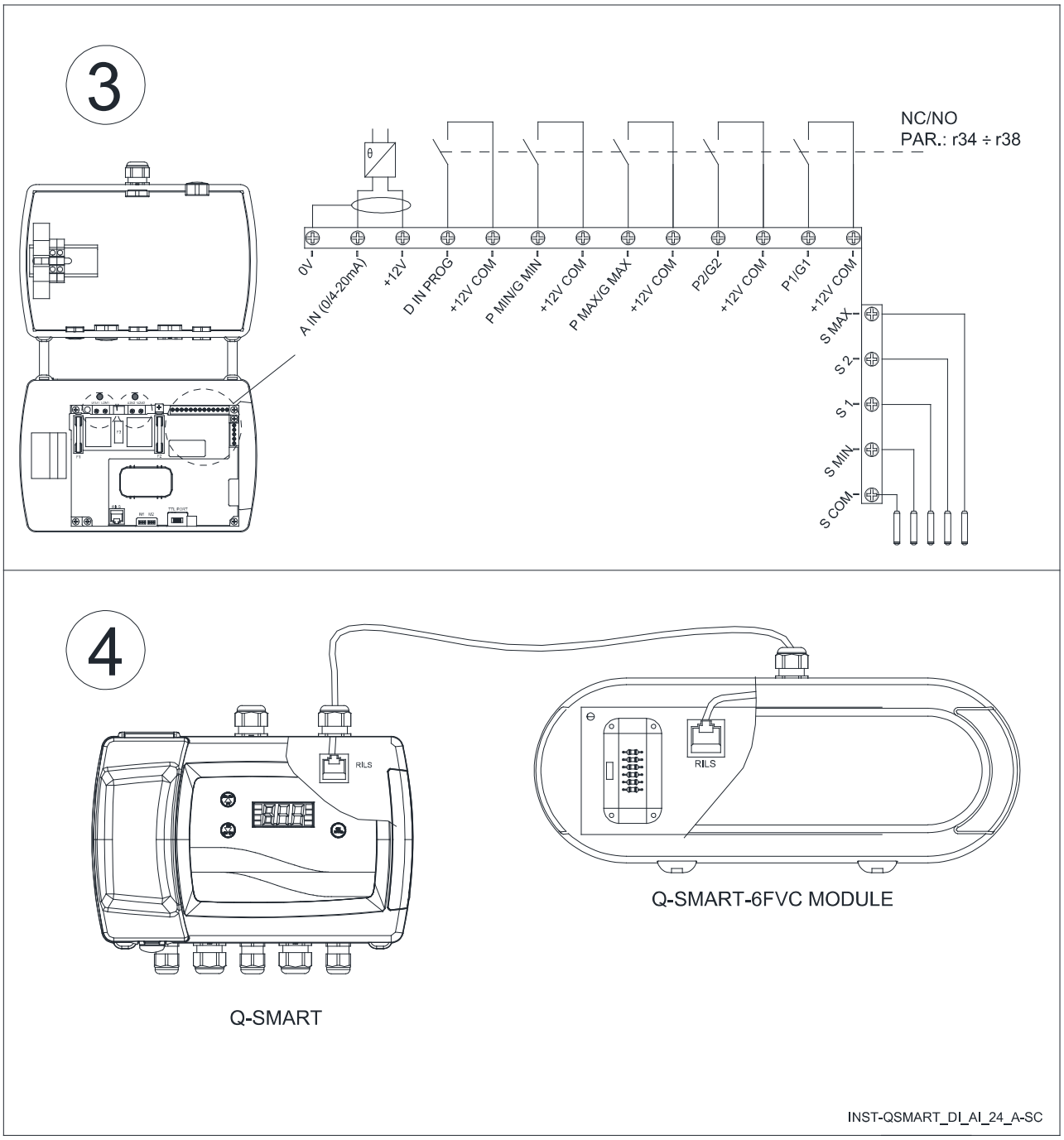
7.


1
2
3
7
4
5
6
U1M1 U2M1
U2M2 U2M2
F3
F1
F2
RILS
M1 M2
TTL PORT
INST-QSMART_CONN_22_A-SC

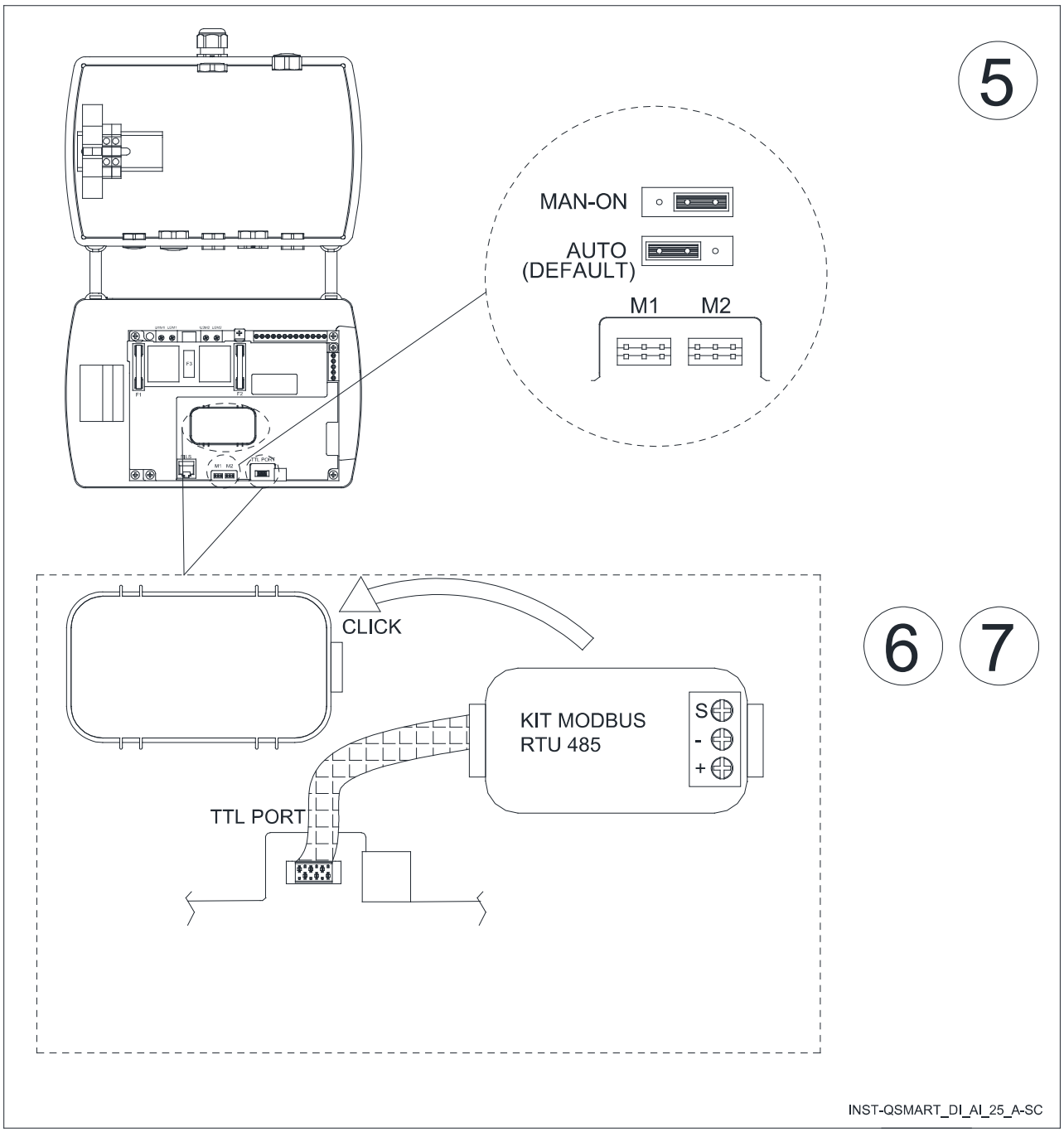
8.


1
1x230 Vac, 50/60Hz
L N
PE
2
M1
L
N
M2
N
L
U1M1
U2M1
U2M2
U1M2
INST-QSMART_CONN_23_A-SC

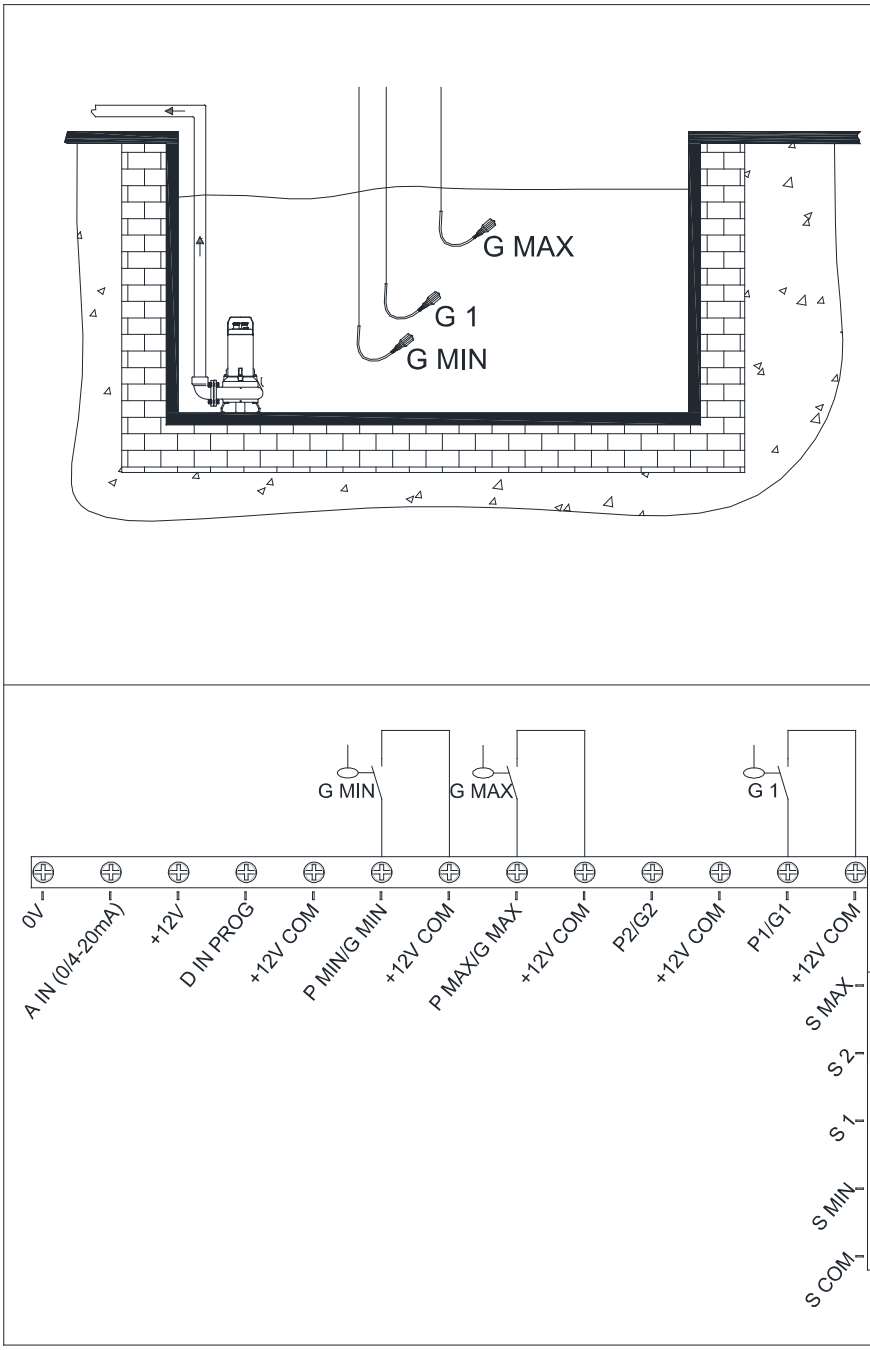
9.


3
NC/NO
PAR.: r34 ÷ r38
0V
A IN (0/4-20mA)
+12V
D IN PROG
+12V COM
P MIN/G MIN
+12V COM
P MAX/G MAX
+12V COM
P2/G2
+12V COM
P1/G1
+12V COM
S MAX
S 2
S 1
S MIN
S COM
4
RILS
RILS
Q-SMART-6FVC MODULE
Q-SMART
INST-QSMART_DI_AI_24_A-SC

10.


5
MAN-ON
AUTO
(DEFAULT)
M1
M2
CLICK
KIT MODBUS
RTU 485
S
-
+
TTL PORT
6
7
INST-QSMART_DI_AI_25_A-SC

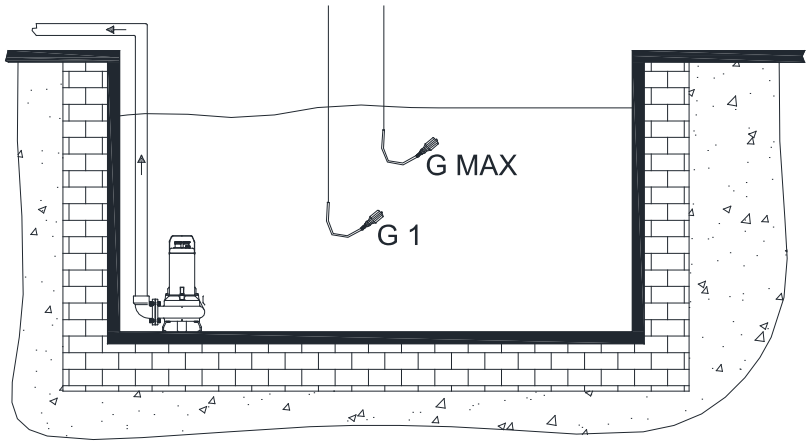
11.

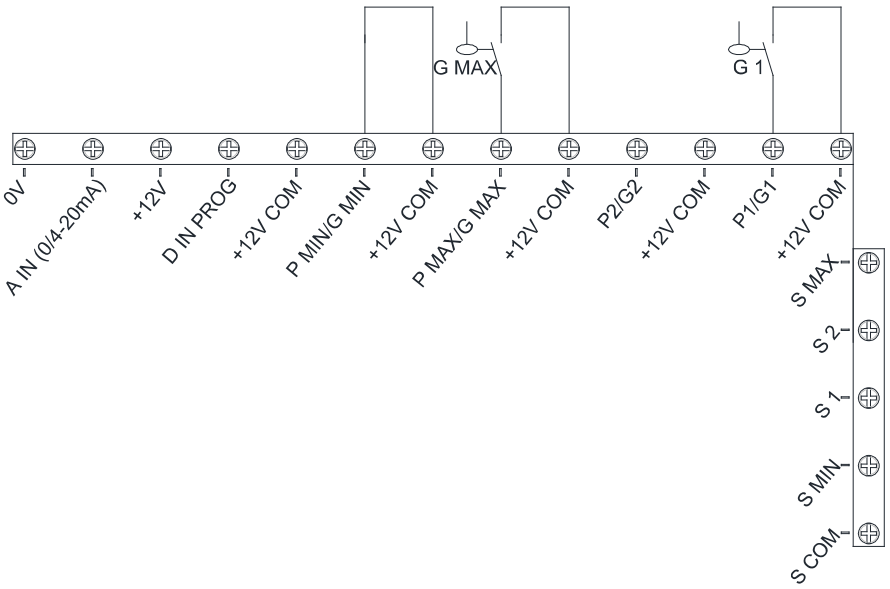


Q-SMART
SE1
c01 = 1
c02 = 0
c03 = 1
t10 = 0 sec
t11 = 0 sec
c14 = 3
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec

INST-QSMART1APPL1S_G_20_B-SC

12.

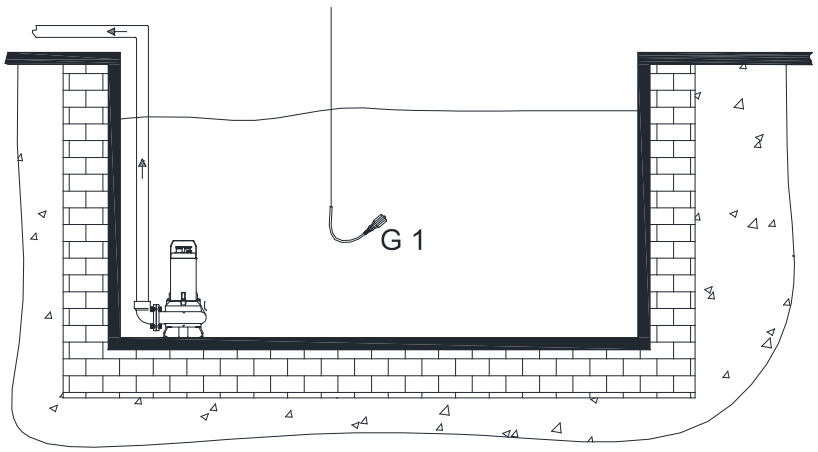


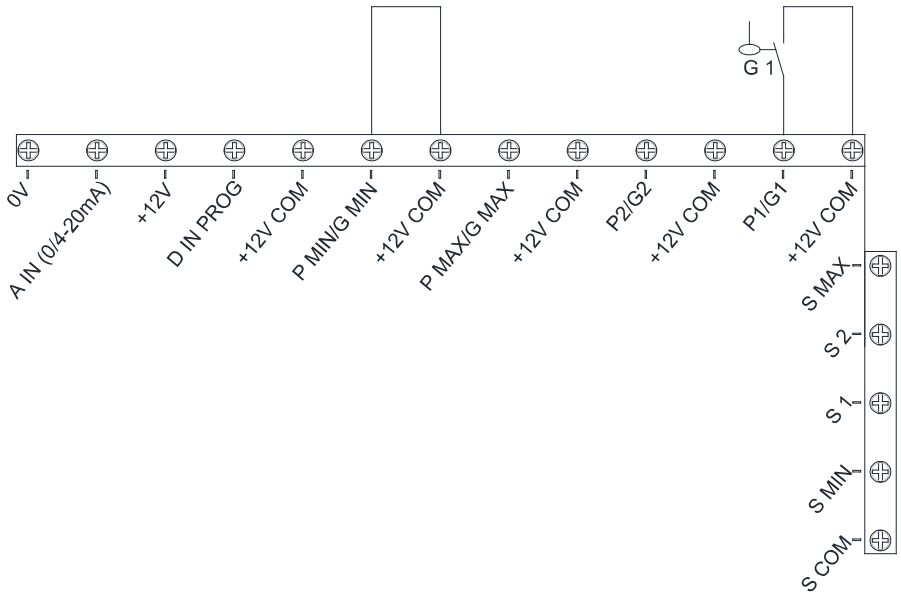


Q-SMART
SE1
c01 = 1
c02 = 0
c03 = 1
t10 = 0 sec
t11 = 0 sec
c14 = 3
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec

INST-QSMART1APPL6S_G_20_B-SC

13.

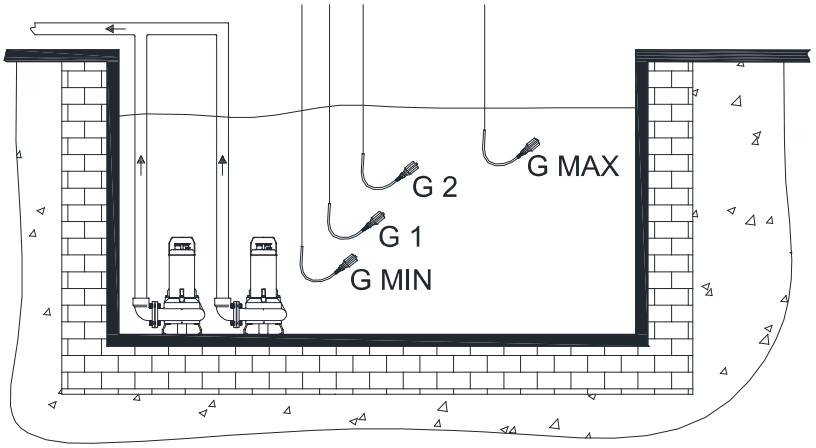


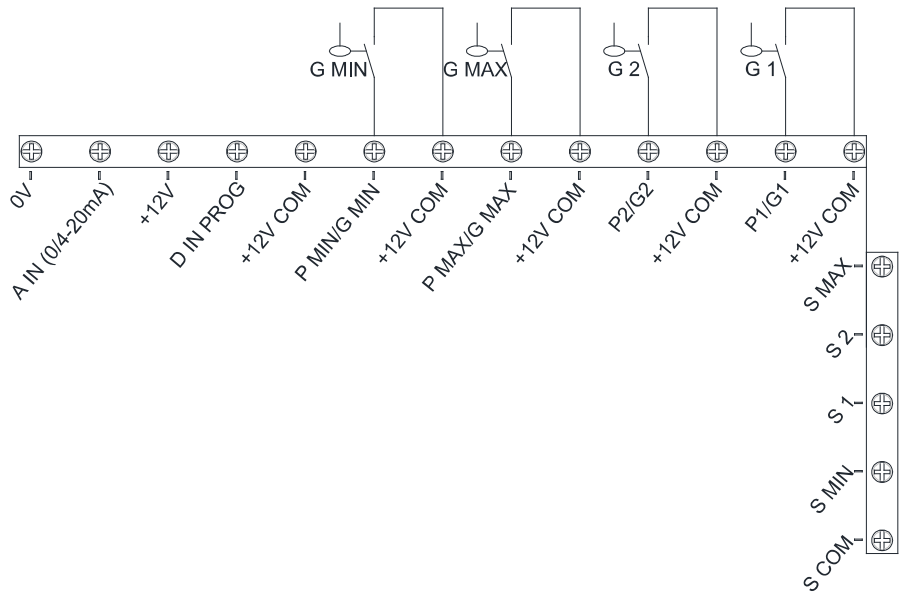


Q-SMART
SE1
c01 = 1
c02 = 0
c03 = 1
t10 = 0 sec
t11 = 0 sec
c14 = 3
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec

INST-QSMART1APPL7S_G_20_B-SC

14.

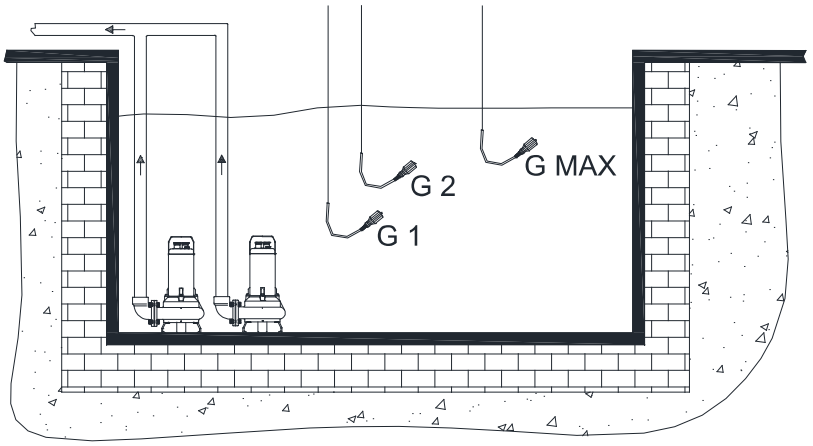


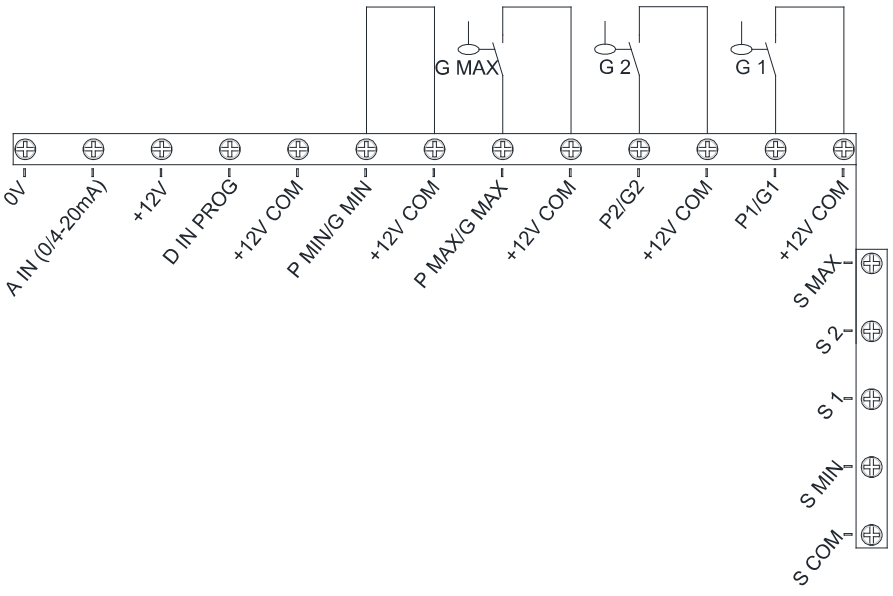


Q-SMART SE2
c01 = 2
c02 = 0
c03 = 1
t10,t11=0 sec
t12,t13=0 sec
c14 = 3
r34 = 2 (NO)
r35 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
c53 = 0

INST-QSMART2APPL1S_G_20_B-SC

15.

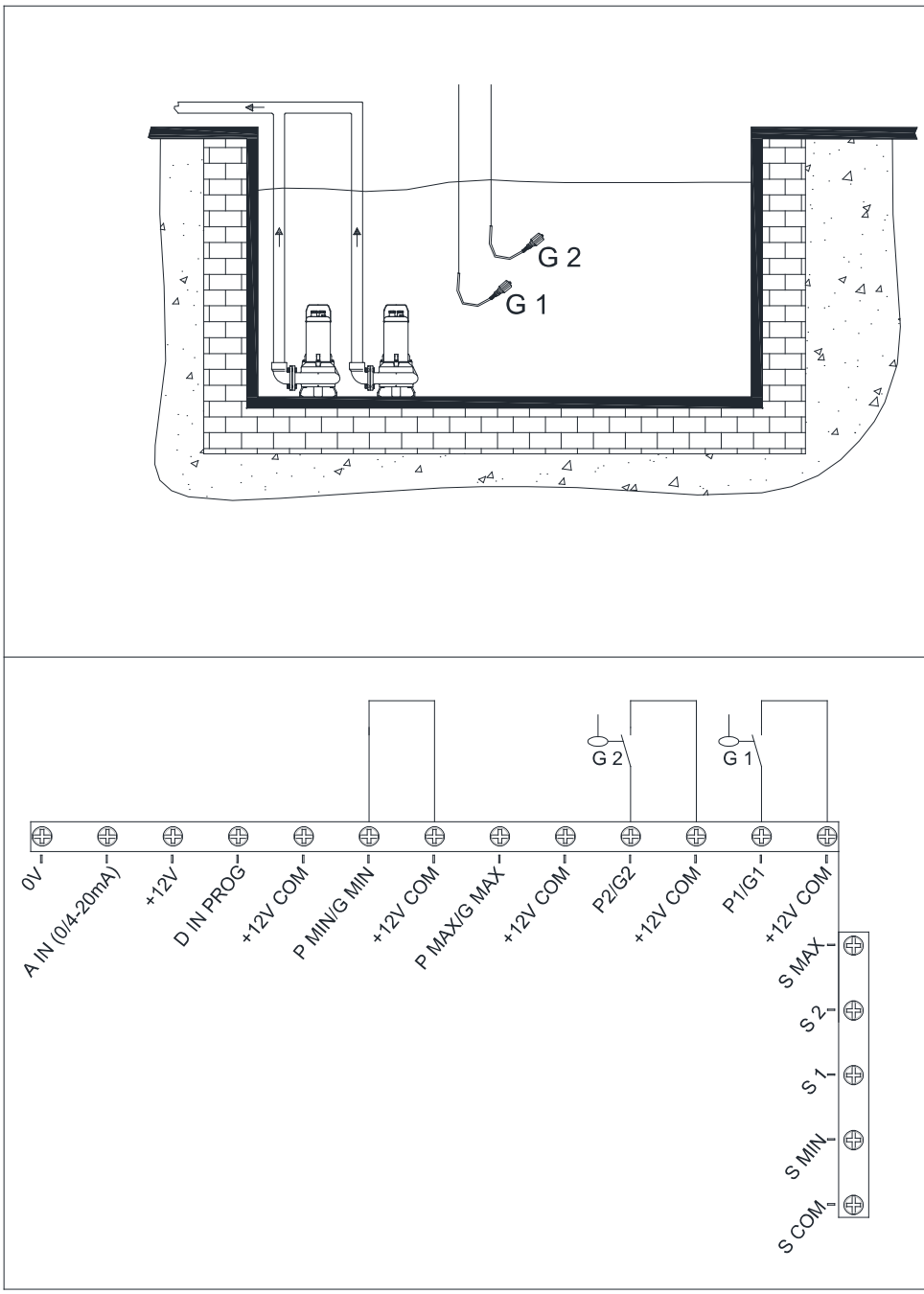




Q-SMART
SE2
c01 = 2
c02 = 0
c03 = 1
t10,t11=0 sec
t12,t13=0 sec
c14 = 3
r34 = 2 (NO)
r35 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec

INST-QSMART2APPL6S_G_20_B-SC

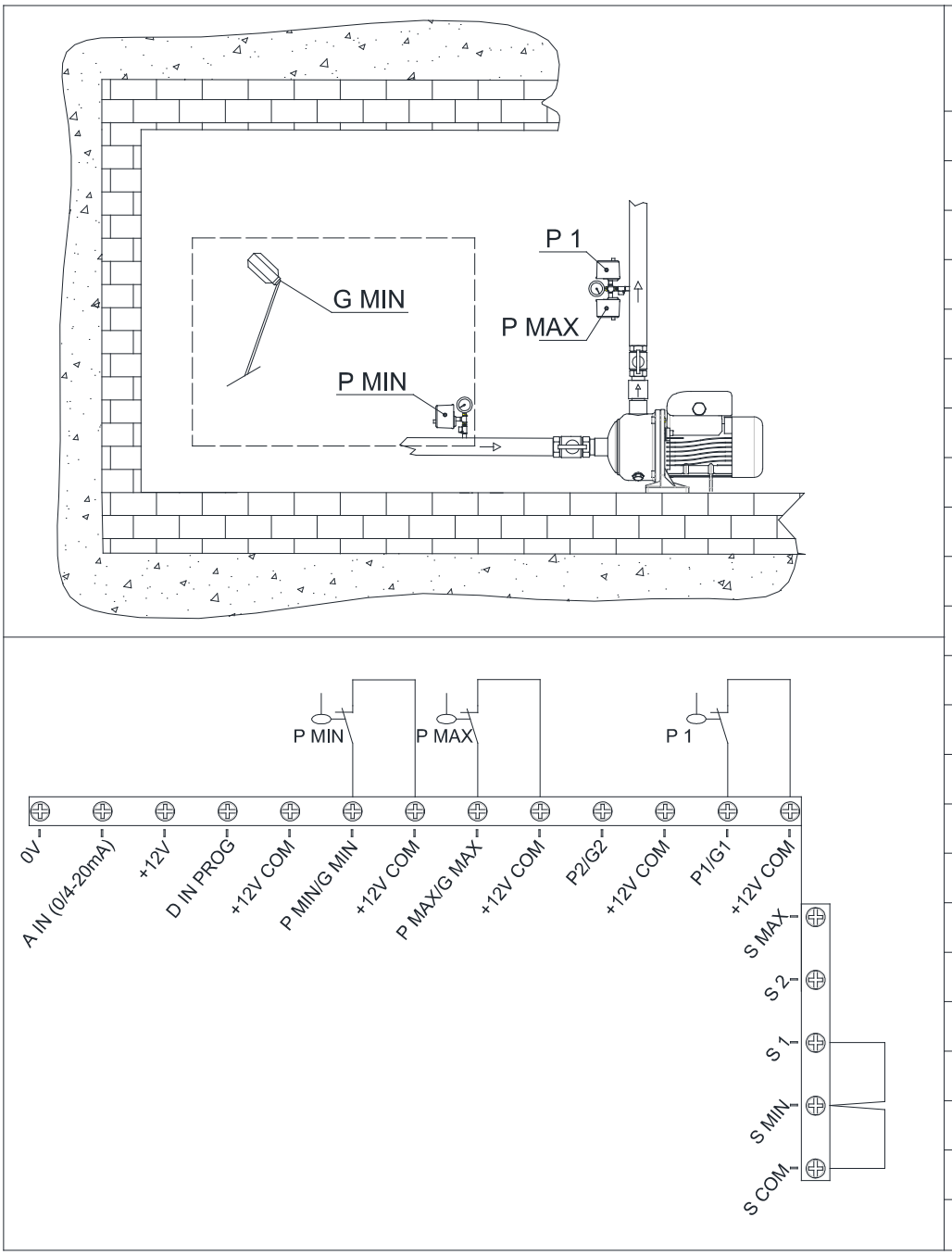
16.



Q-SMART
SE2
c01 = 2
c02 = 0
c03 = 1
t10,t11=0 sec
t12,t13=0 sec
c14 = 3
r34 = 2 (NO)
r35 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec

INST-QSMART2APPL7S_G_20_B-SC

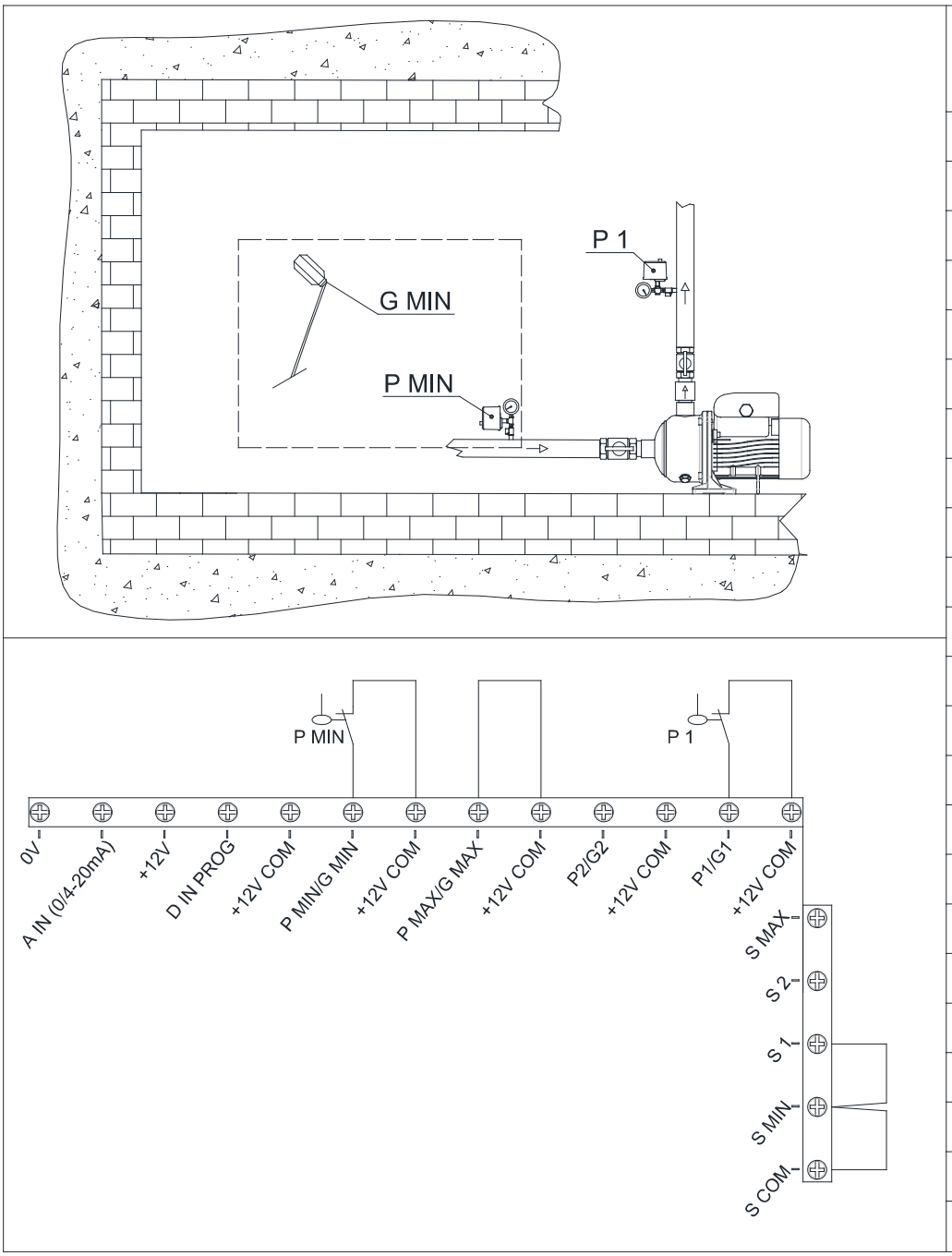
17.



Q-SMART
bS1
c01 = 1
c03 = 4
t10 = 0 sec
t11 = 0 sec
r34 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART1APPL4B_G_20_B-SC

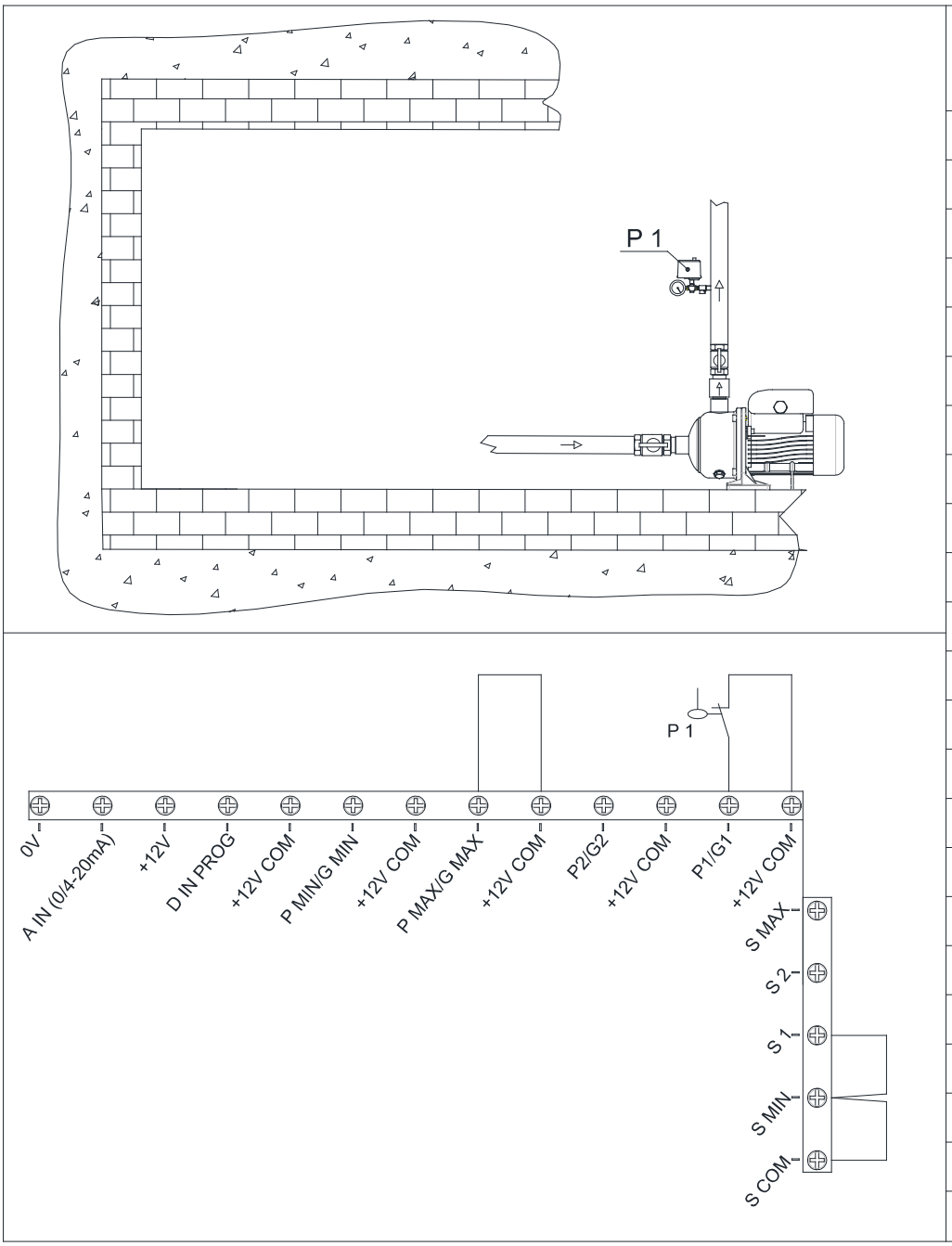
18.



Q-SMART
bS1
c01 = 1
c03 = 4
t10 = 0 sec
t11 = 0 sec
r34 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART1APPL7B_G_20_B-SC

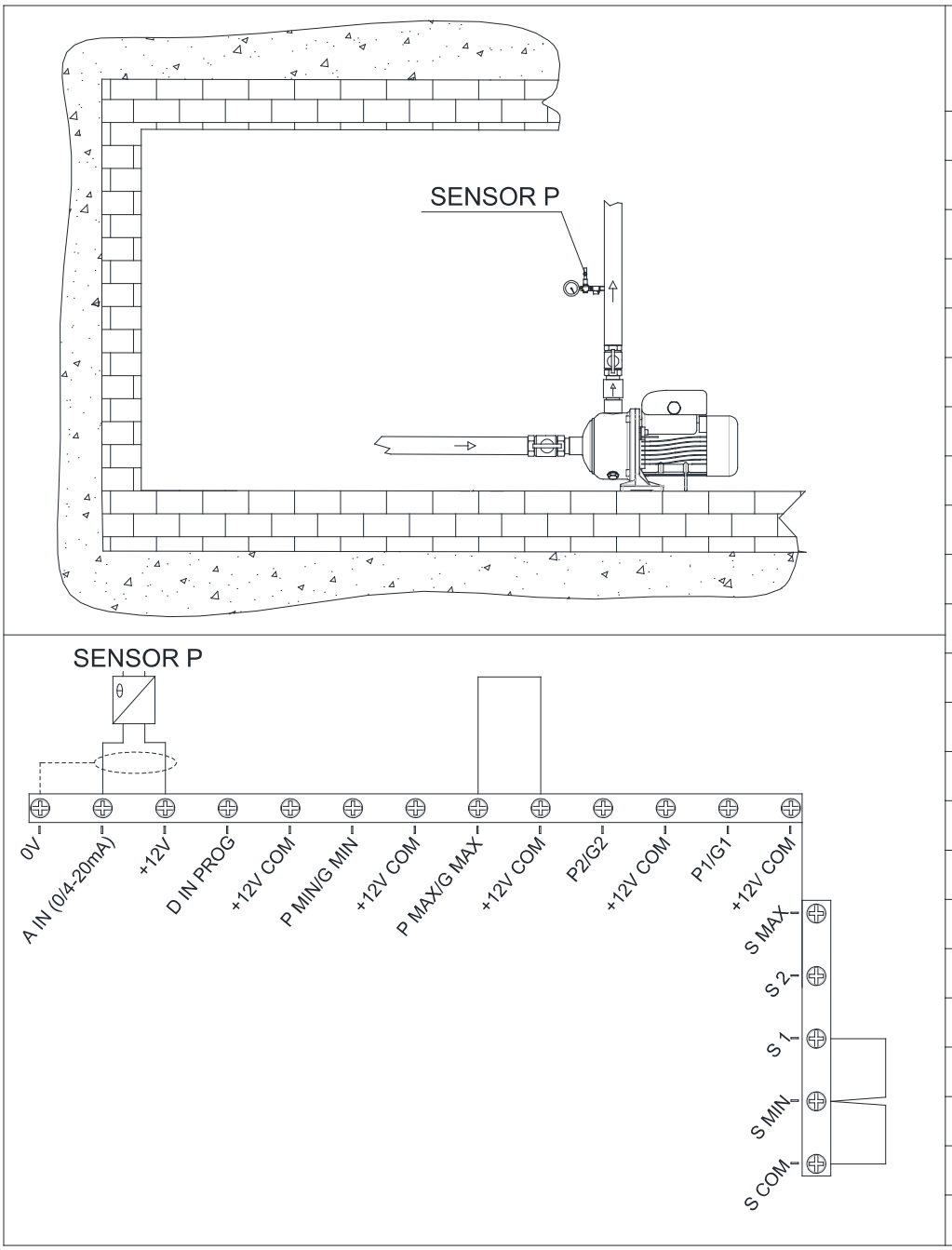
19.



Q-SMART
bS1
c01 = 1
c03 = 4
t10 = 0 sec
t11 = 0 sec
r34 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART1APPL8B_G_20_B-SC

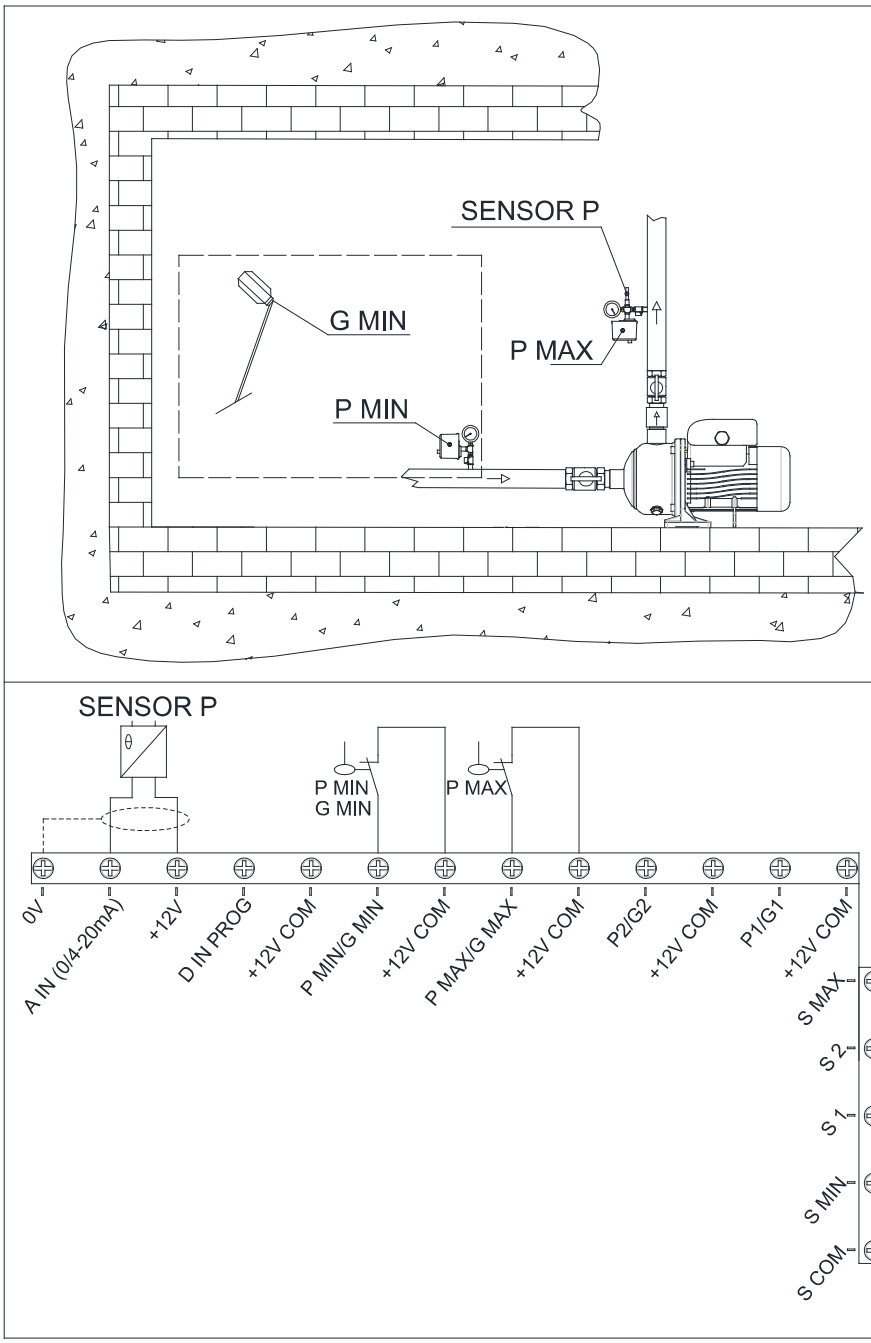
20.



Q-SMART
bS1
c01 = 1
c03 = 1
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL10B_G_20_B-SC

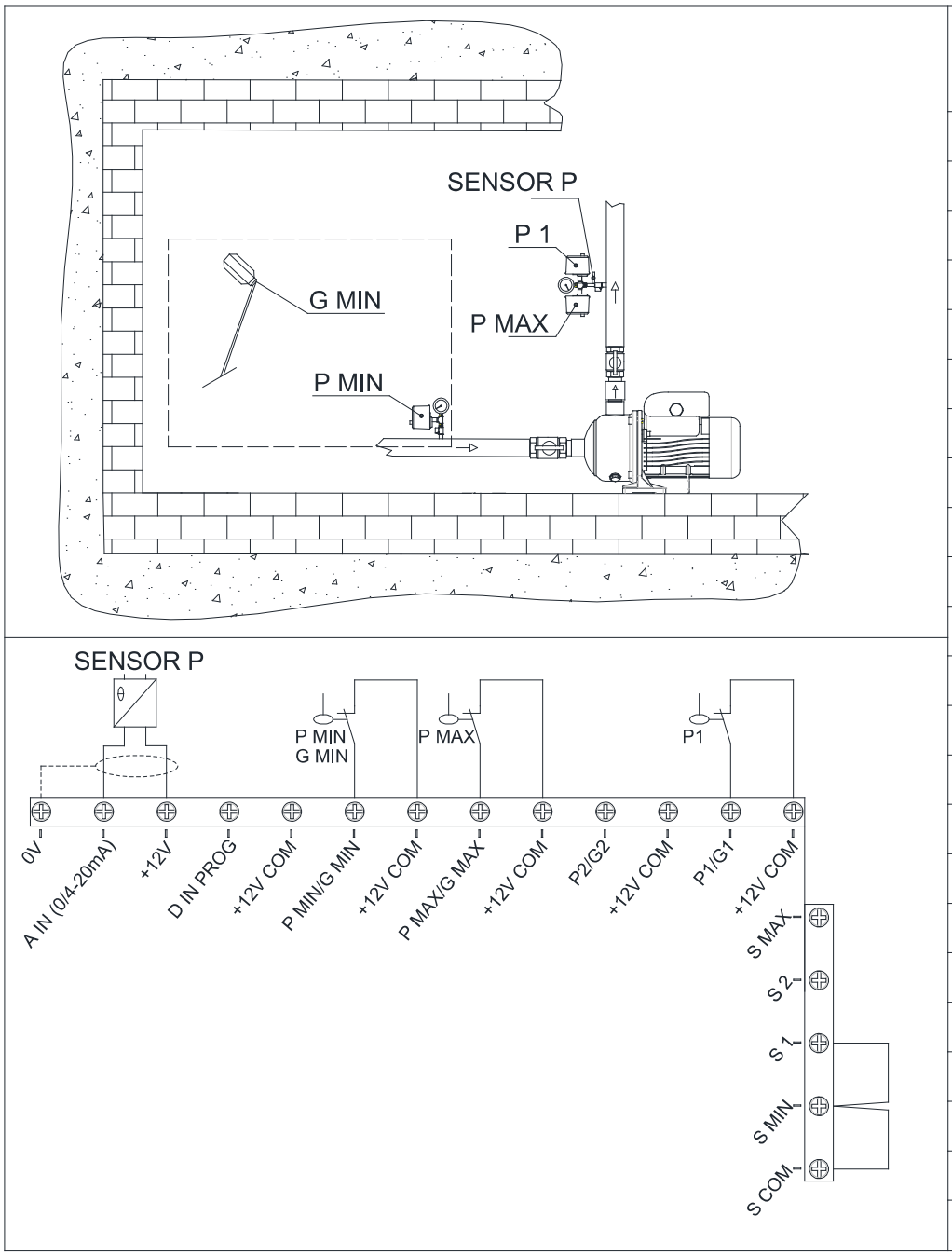
21.



Q-SMART
bS1
c01 = 1
c03 = 1
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL1B_G_20_B-SC

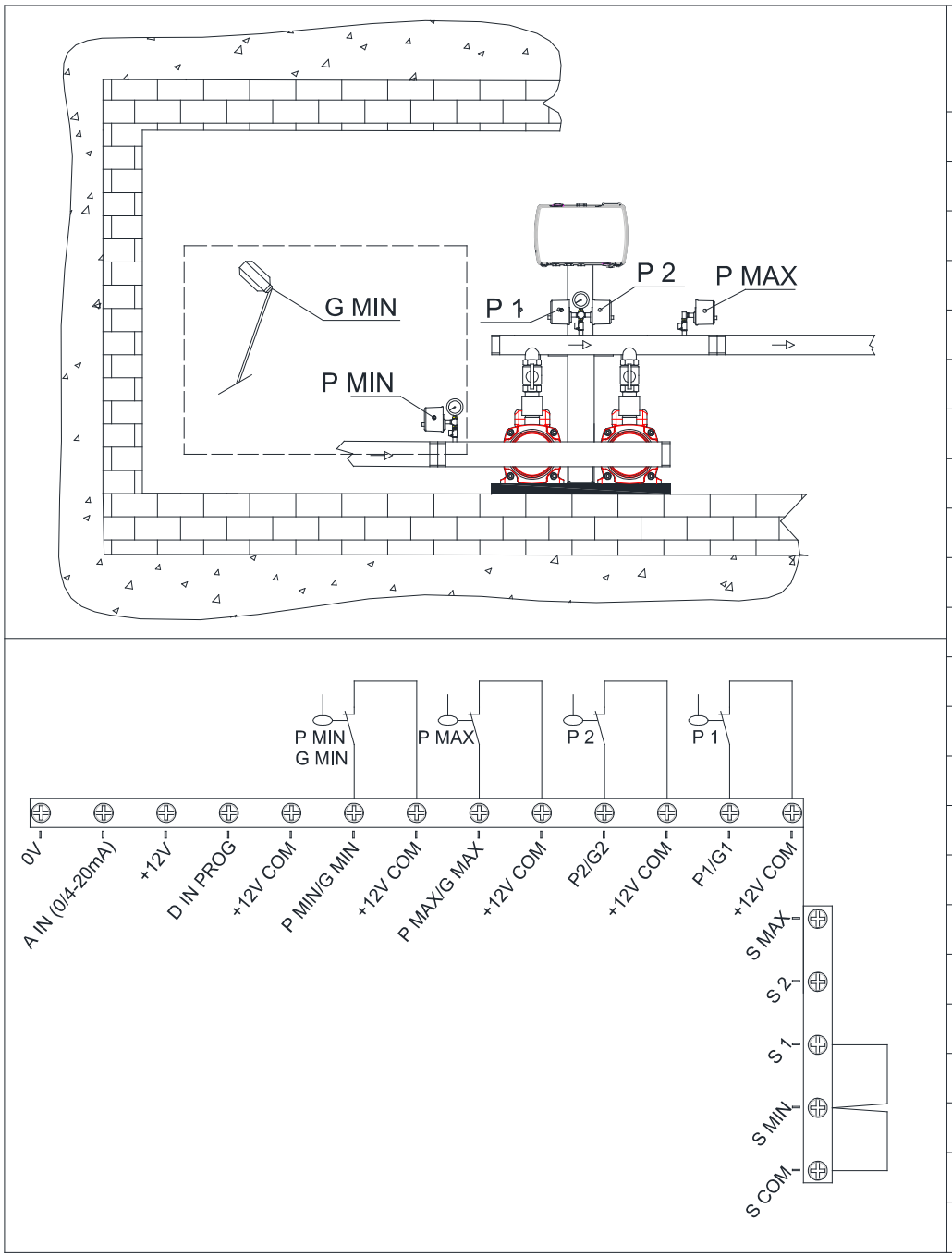
22.



Q-SMART
bS1
c01 = 1
c03 = 6
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r34 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL6B_G_20_B-SC

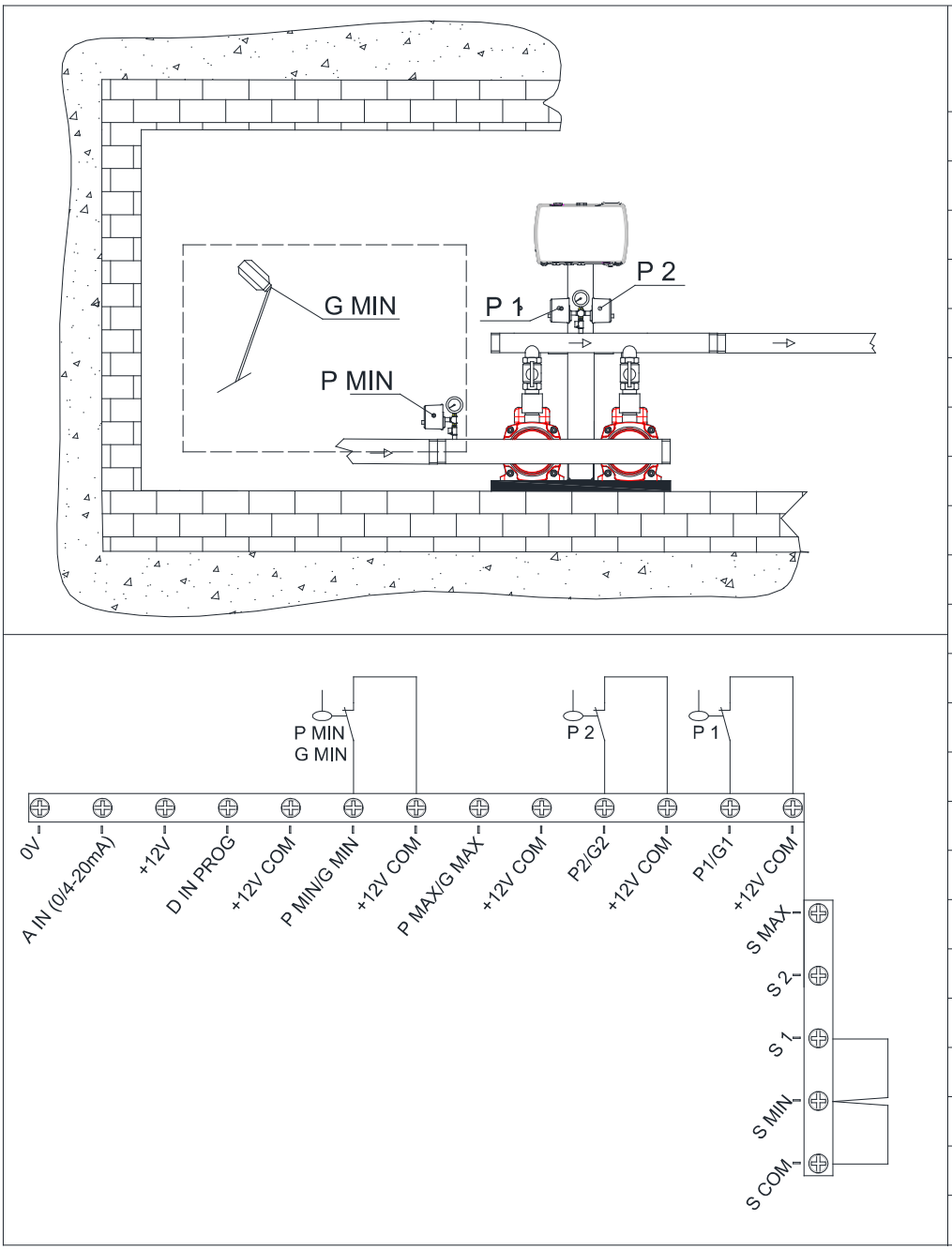
23.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 4
t10,t11=0 sec
t12,t13=0 sec
r34 = 1 (NC)
r35 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART2APPL4B_G_20_B-SC

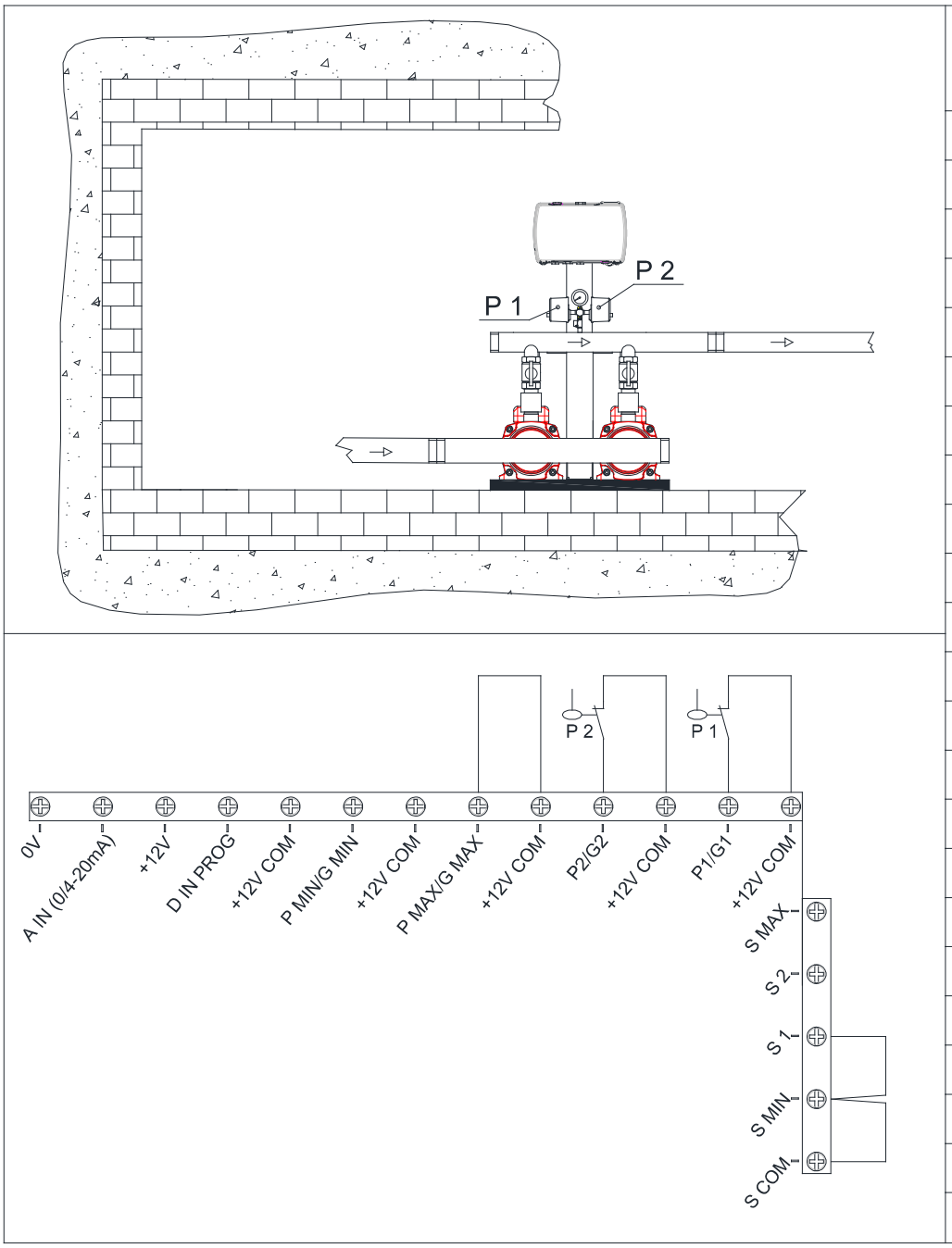
24.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 4
t10,t11=0 sec
t12,t13=0 sec
r34 = 1 (NC)
r35 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART2APPL7B_G_20_B-SC

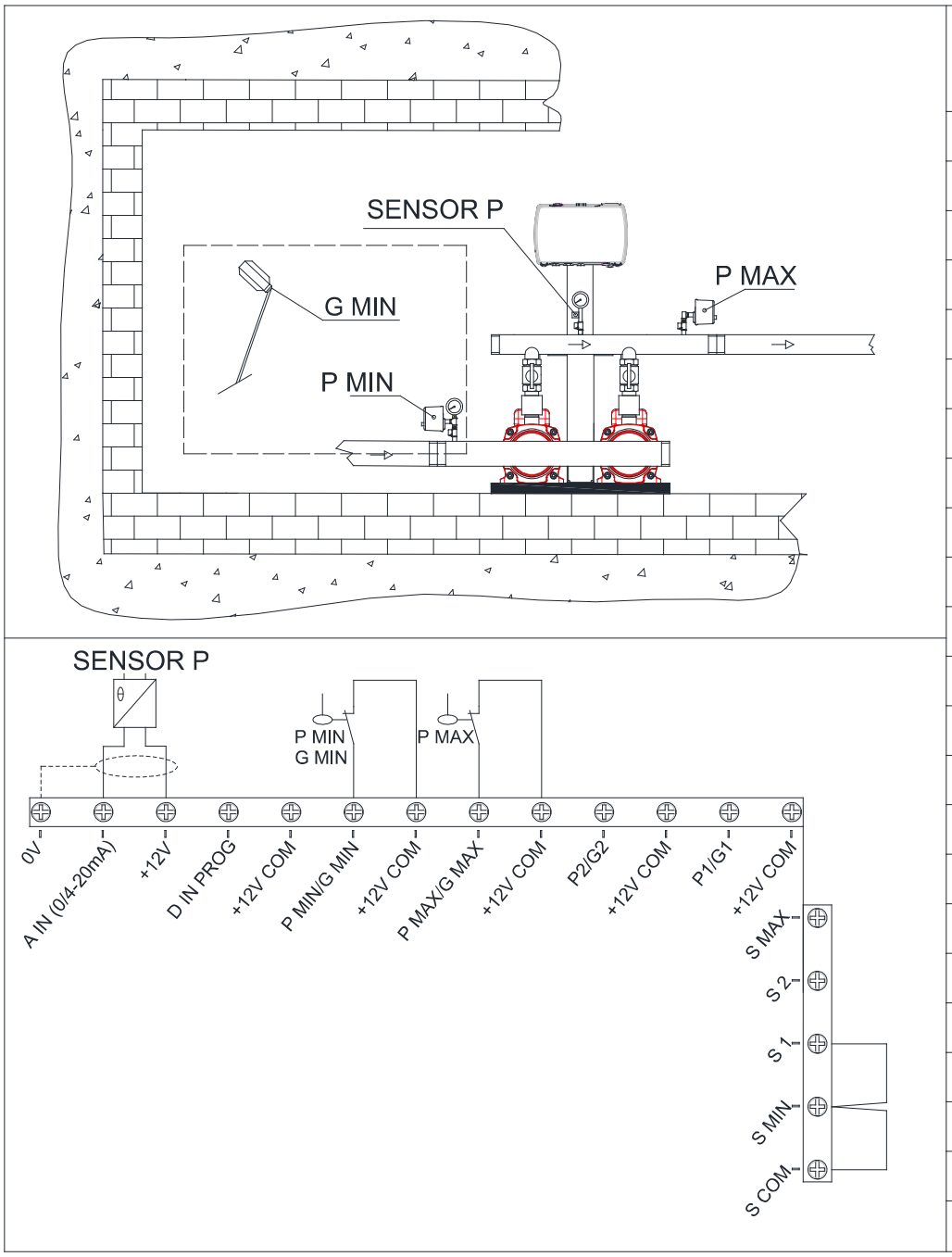
25.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 4
t10,t11=0 sec
t12,t13=0 sec
r34 = 1 (NC)
r35 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART2APPL8B_G_20_B-SC

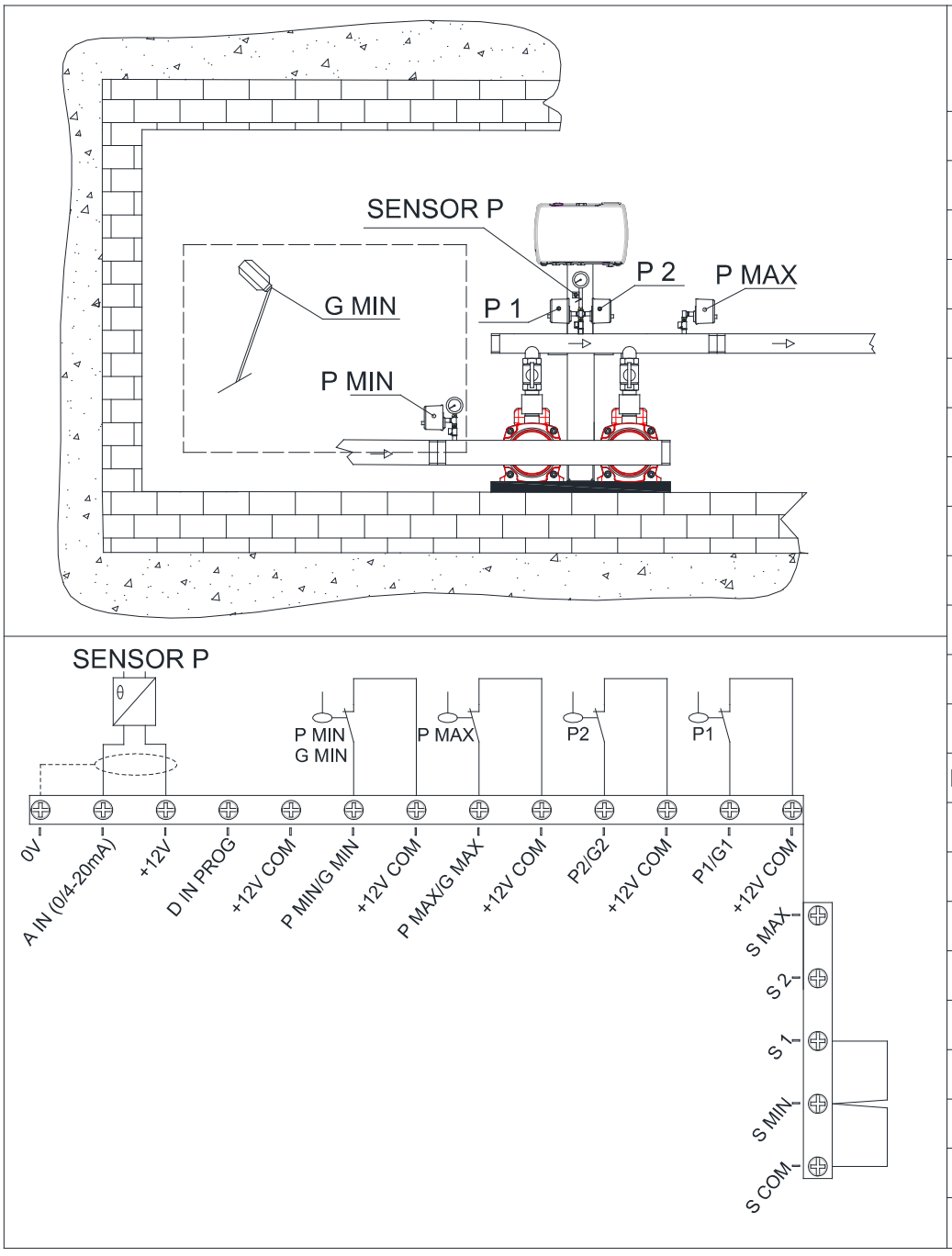
26.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 1
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART2APPL1B_G_20_B-SC

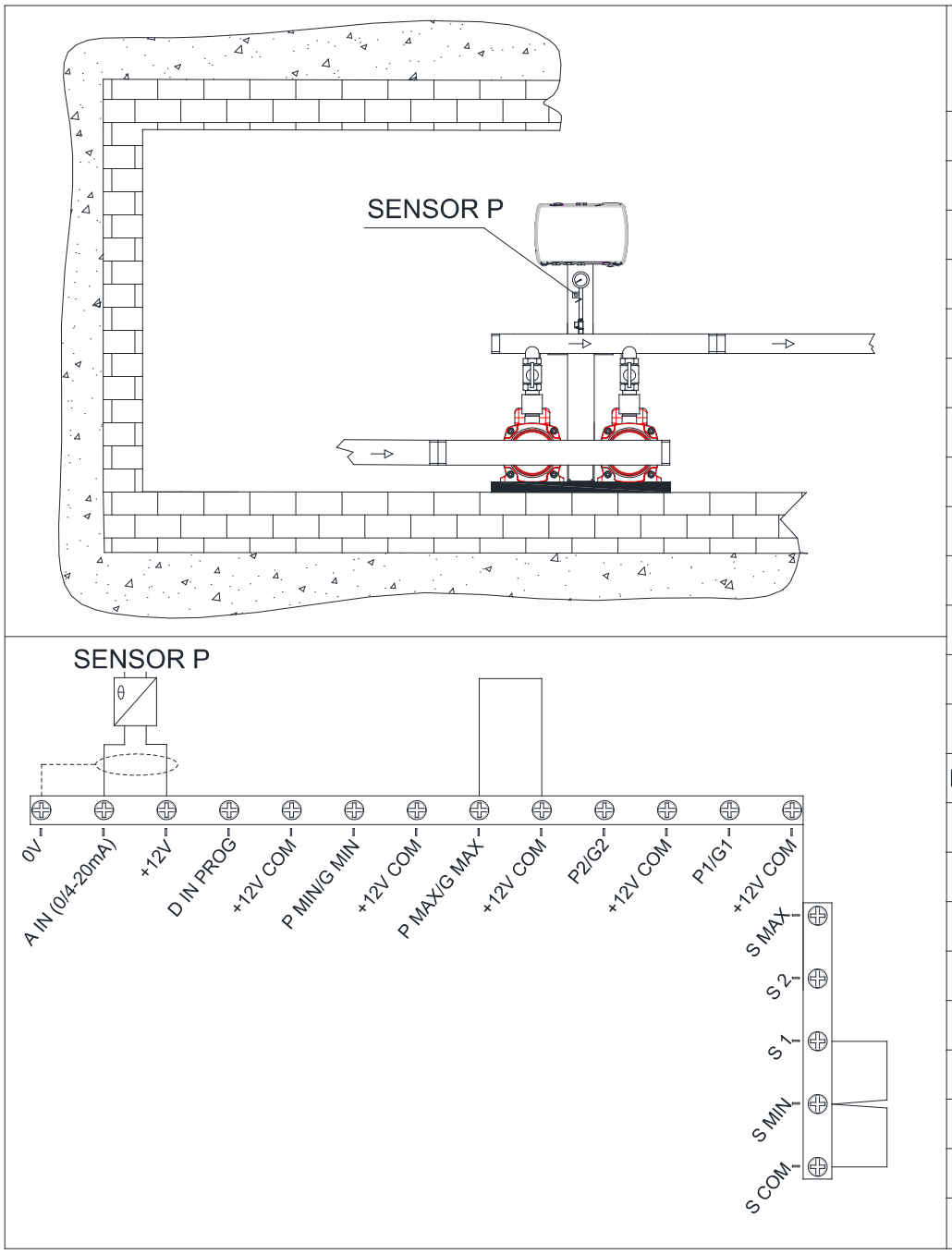
27.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 6
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
r34,r35=1(NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART2APPL6B_G_20_B-SC

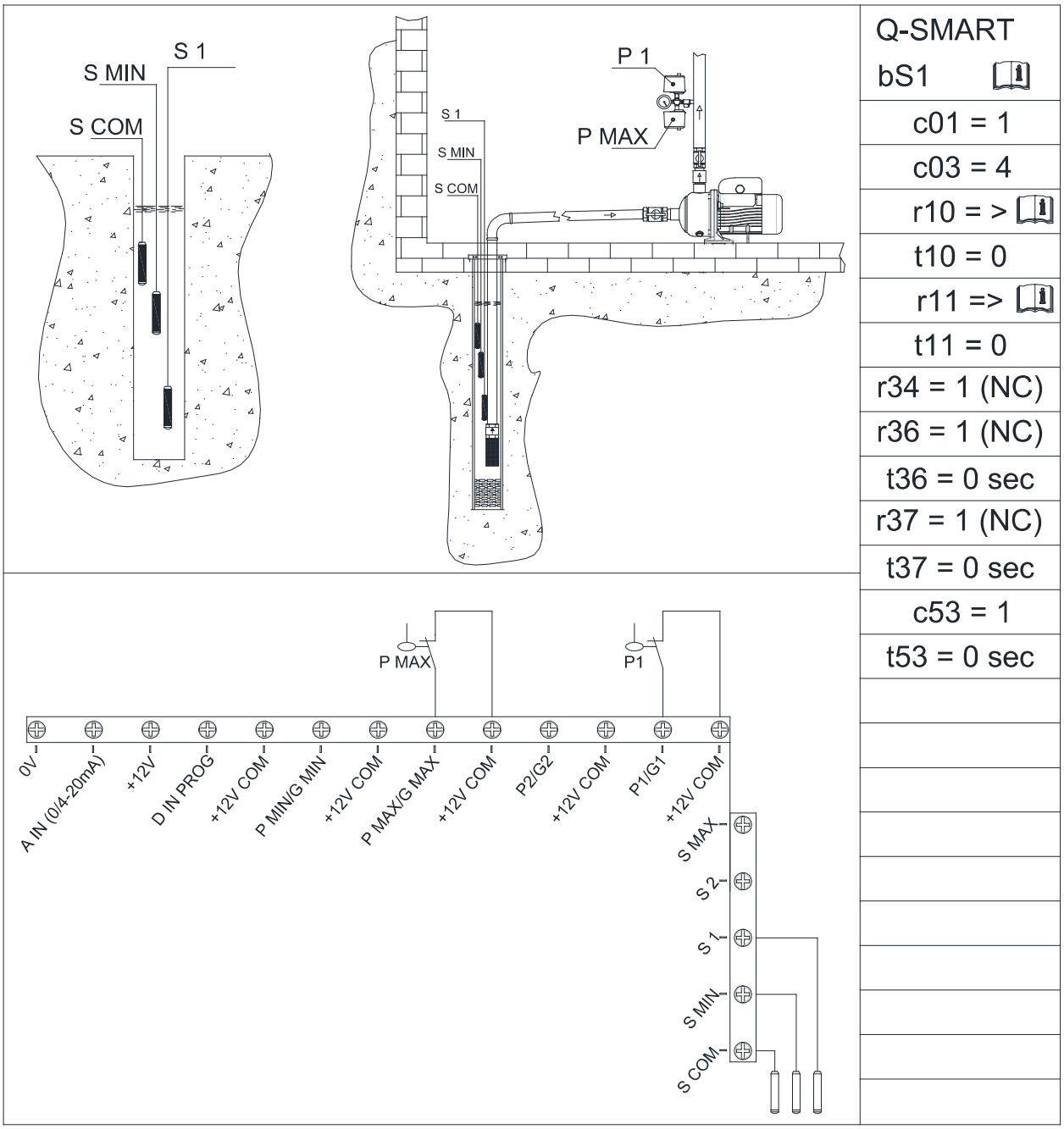
28.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 1
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
r34,r35=1(NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART2APPL10B_G_20_B-SC

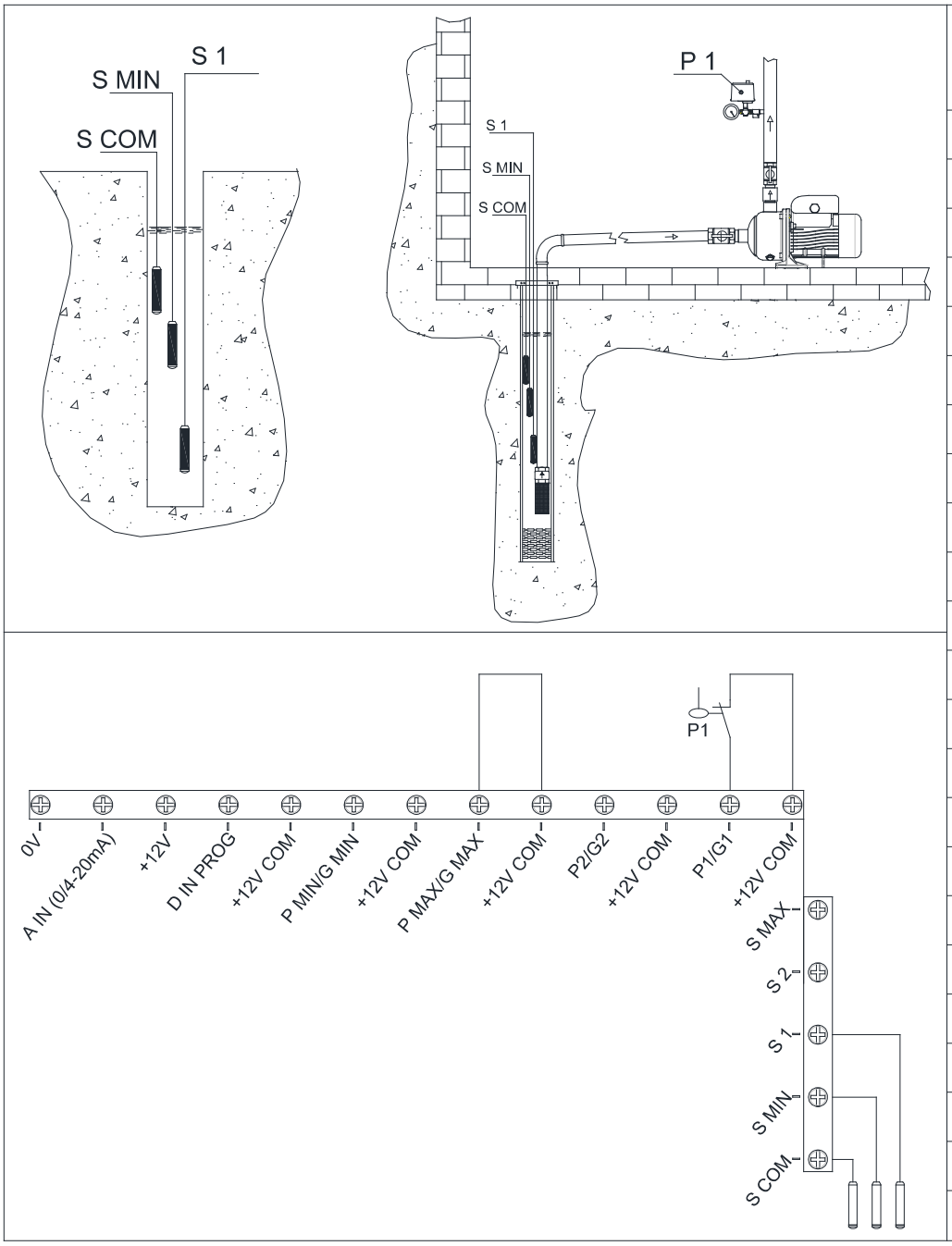
29.



Q-SMART
bS1
c01 = 1
c03 = 4
r10 = >
t10 = 0
r11 =>
t11 = 0
r34 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART1APPL4B2_G_20_B-SC

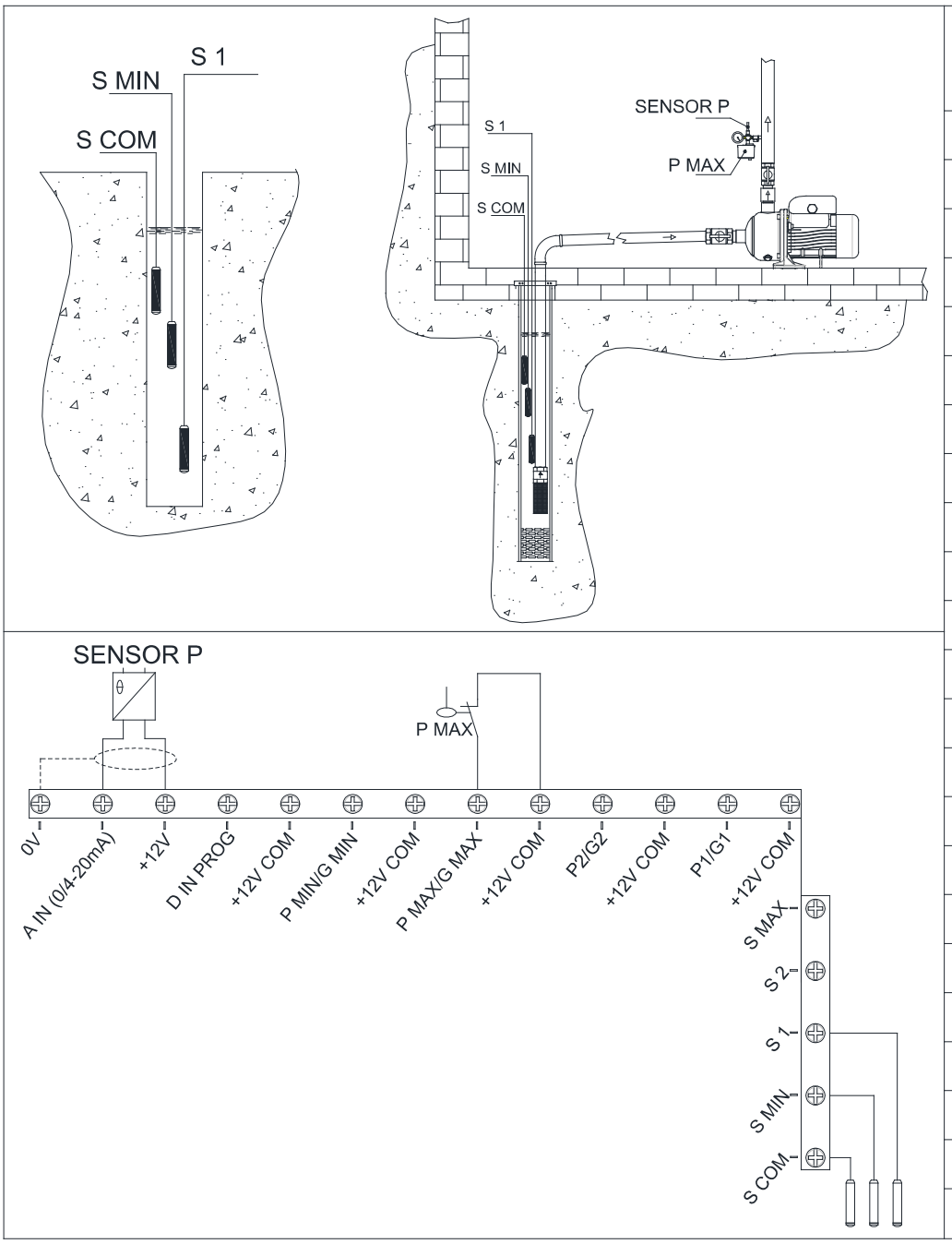
30.



Q-SMART
bS1
c01 = 1
c03 = 4
r10 = >
t10 = 0
r11 =>
t11 = 0
r34 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART1APPL4B3_G_20_B-SC

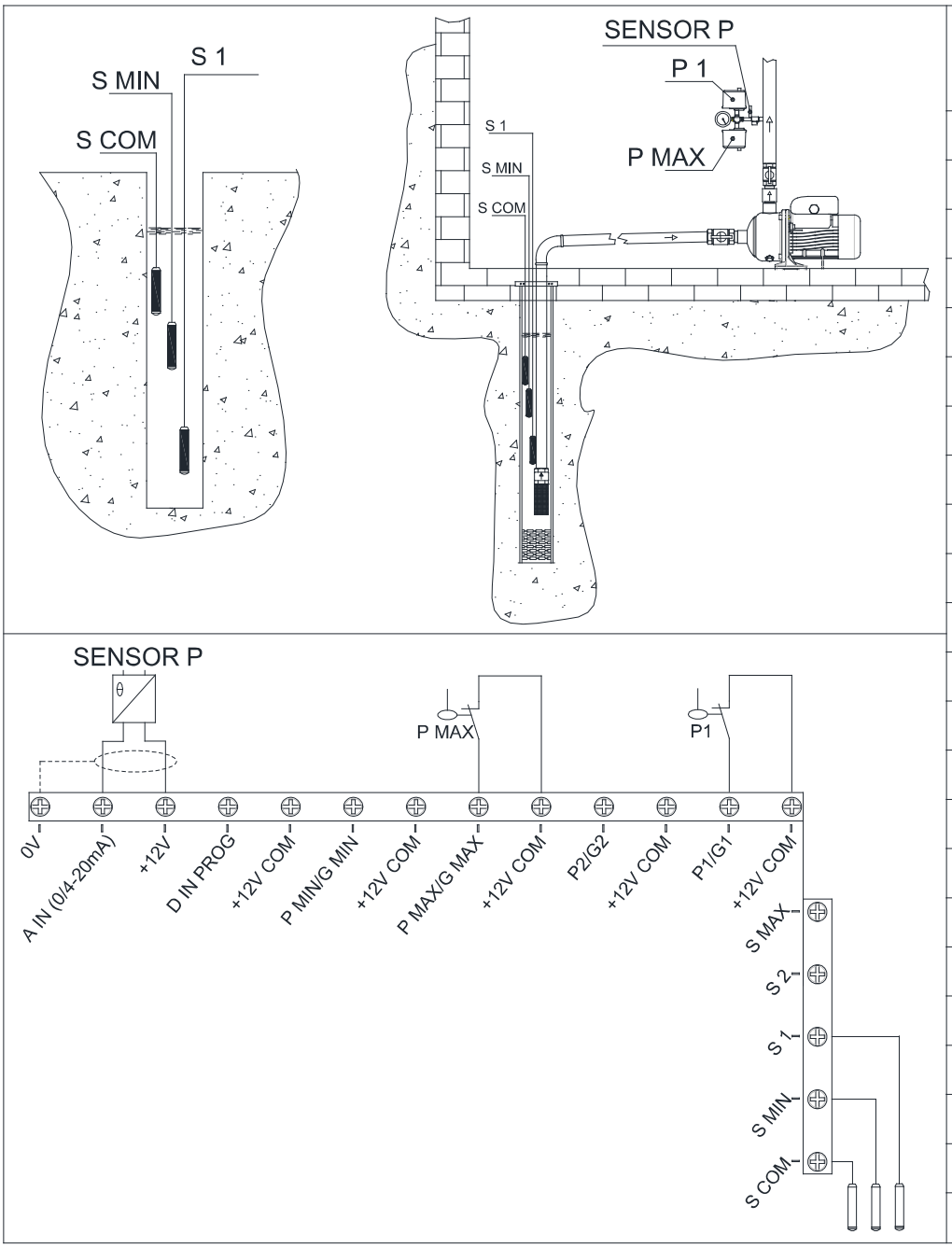
31.



Q-SMART
bS1
c01 = 1
c03 = 1
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL1B2_G_20_B-SC

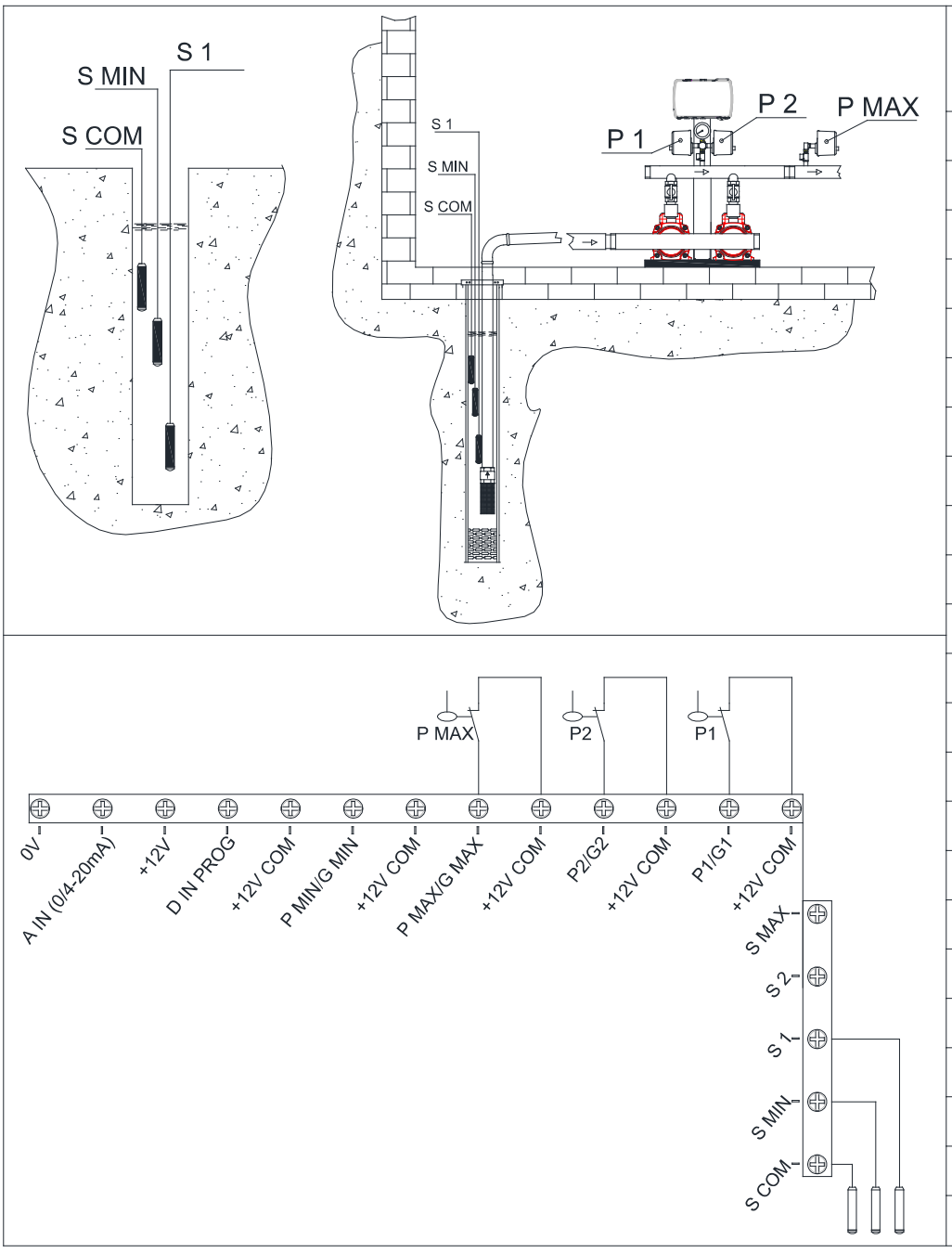
32.



Q-SMART
bS1
c01 = 1
c03 = 6
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r34 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL6B2_G_20_B-SC

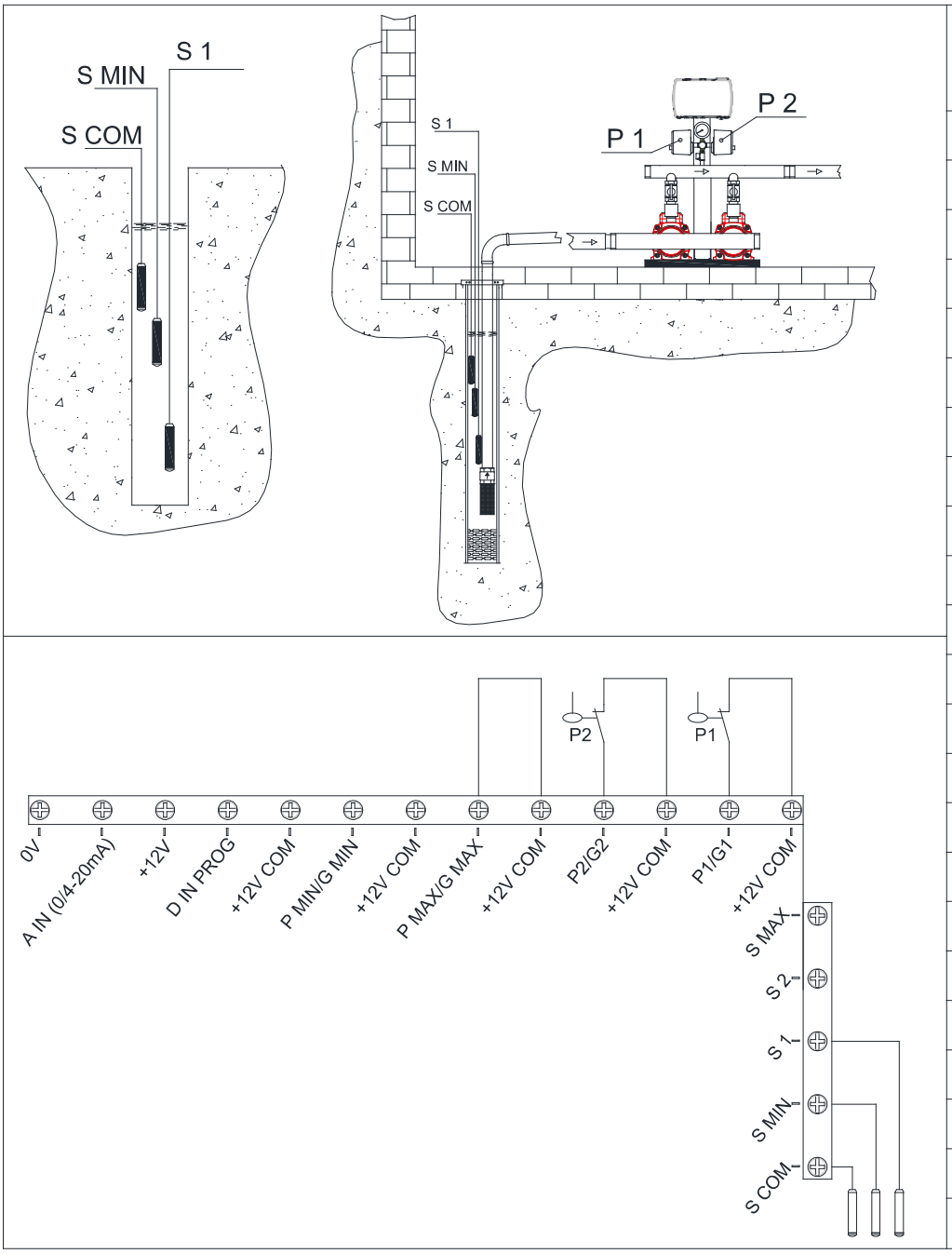
33.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 4
t10 = 0
t11 = 0
t12 = 0
t13 = 0
r34 = 1 (NC)
r35 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART2APPL4B2_G_20_B-SC

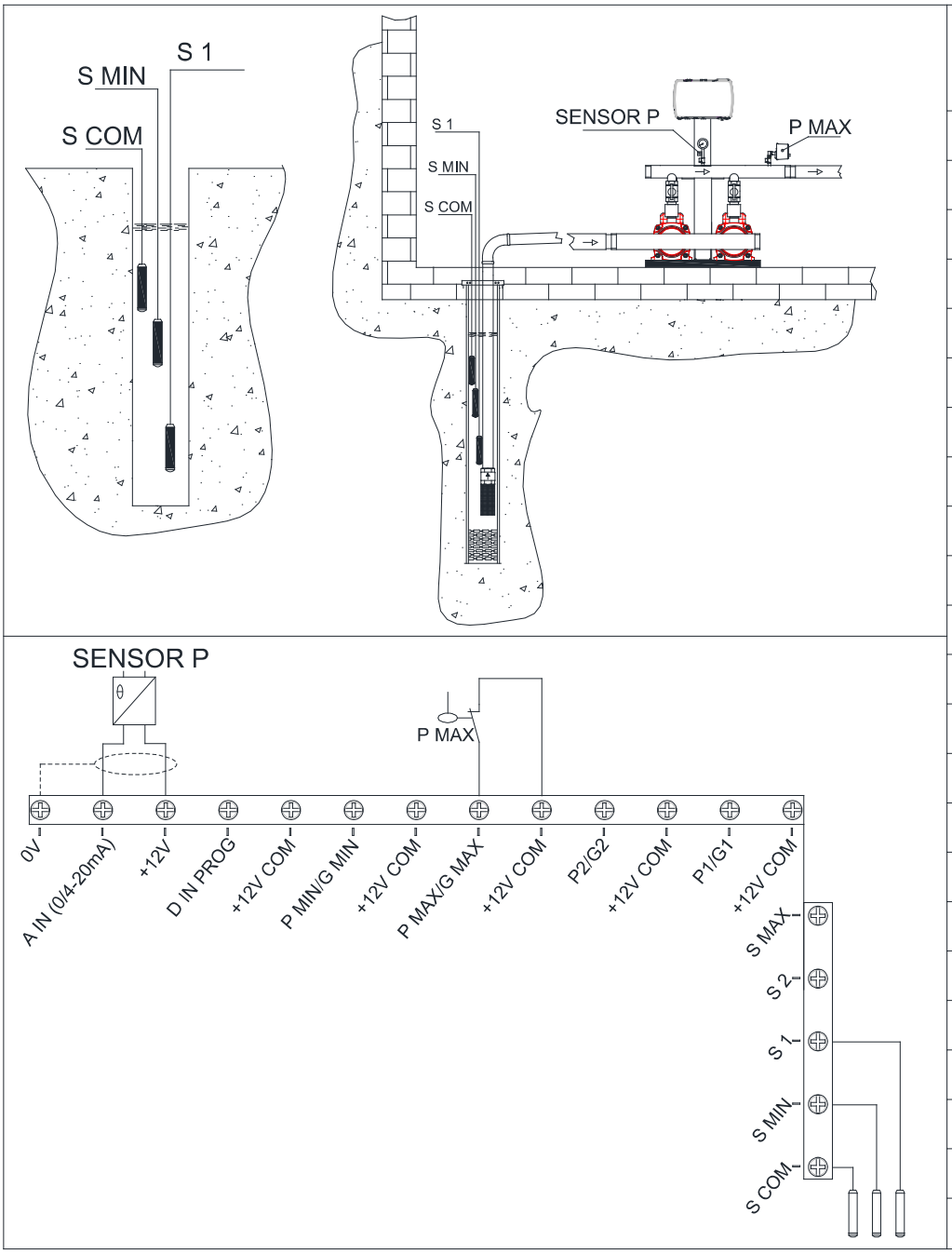
34.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 4
t10 = 0
t11 = 0
t12 = 0
t13 = 0
r34 = 1 (NC)
r35 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec

INST-QSMART2APPL4B3_G_20_B-SC

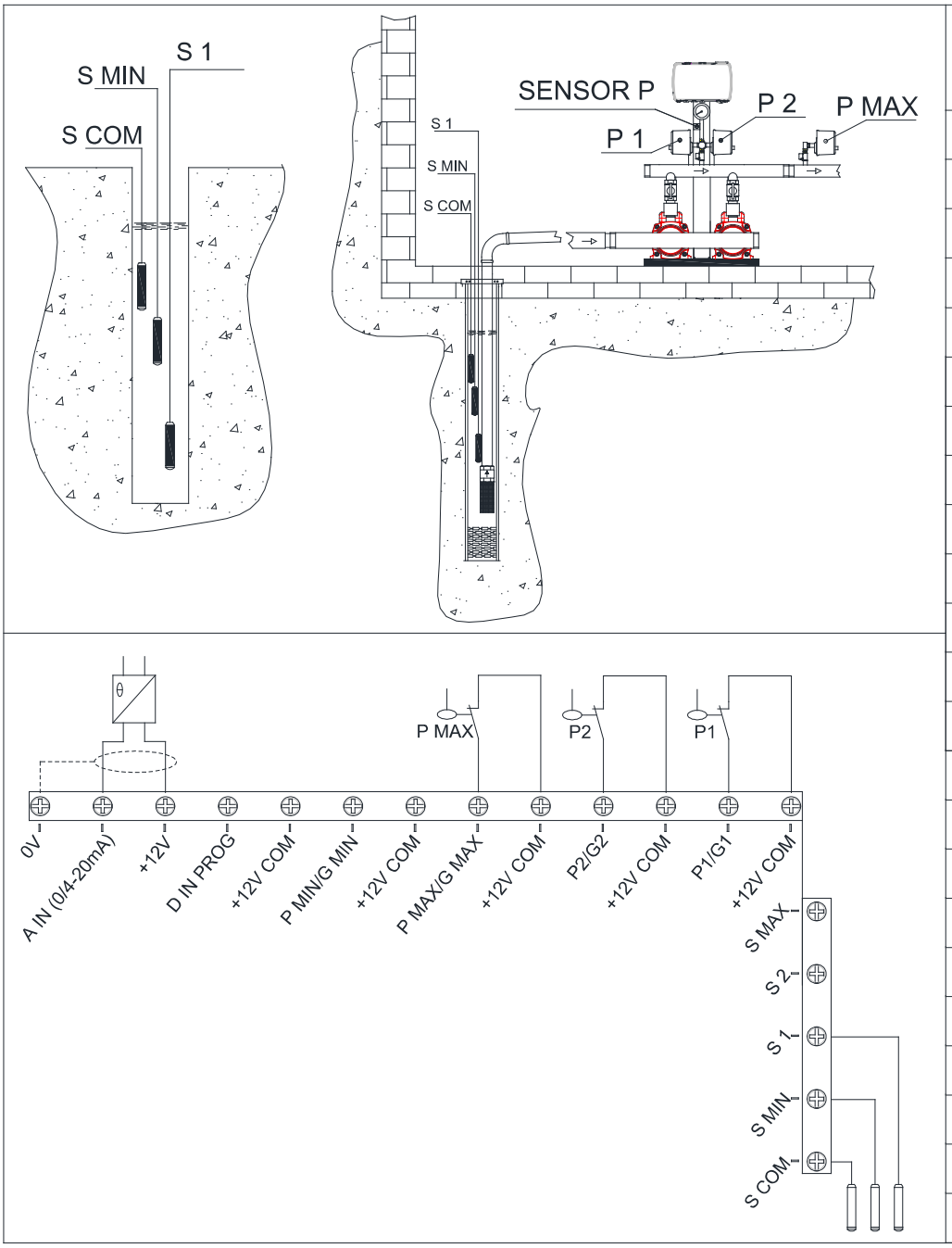
35.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 1
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART2APPL1B2_G_20_B-SC

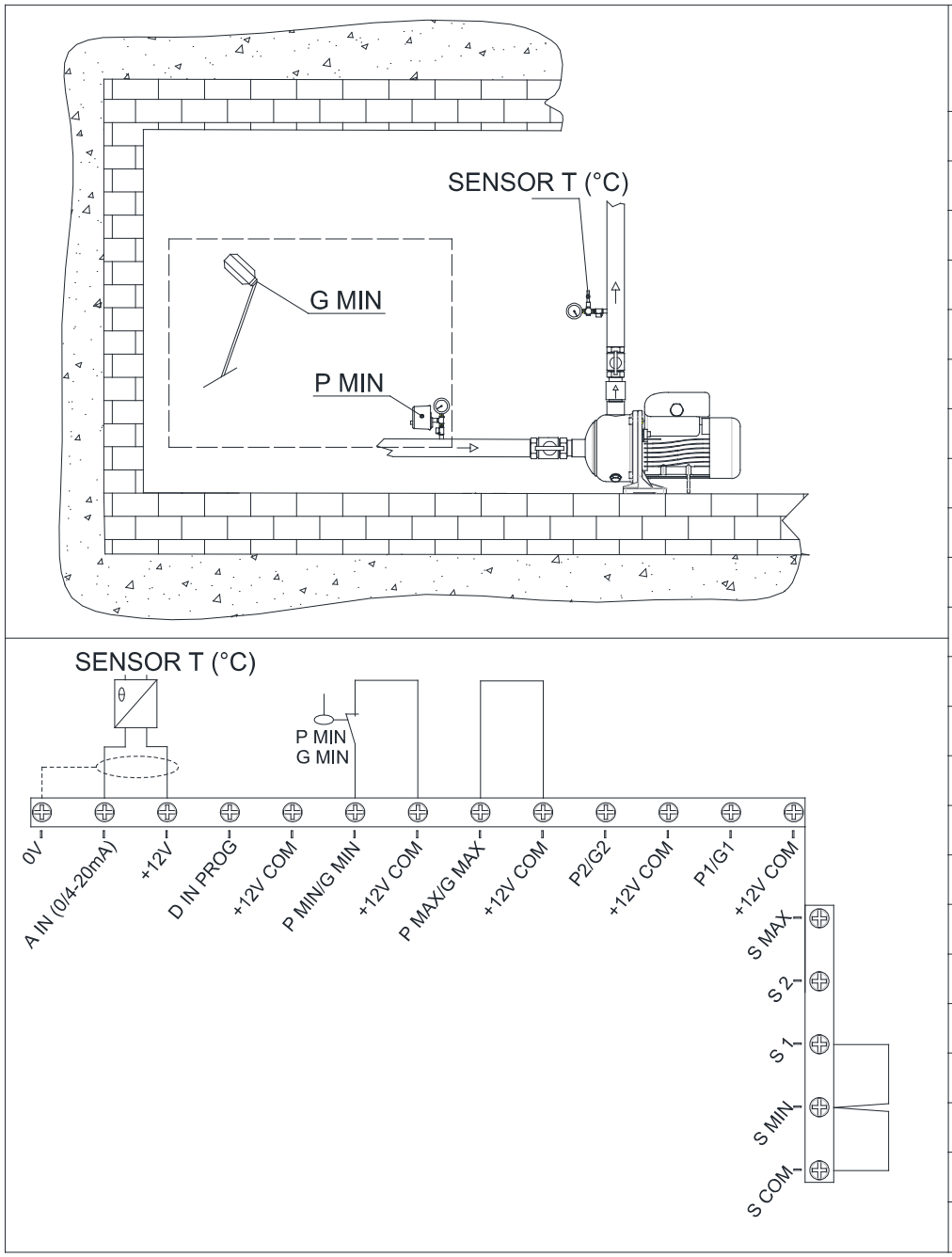
36.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 6
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
r34 = 1 (NC)
r35 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART2APPL6B2_G_20_B-SC

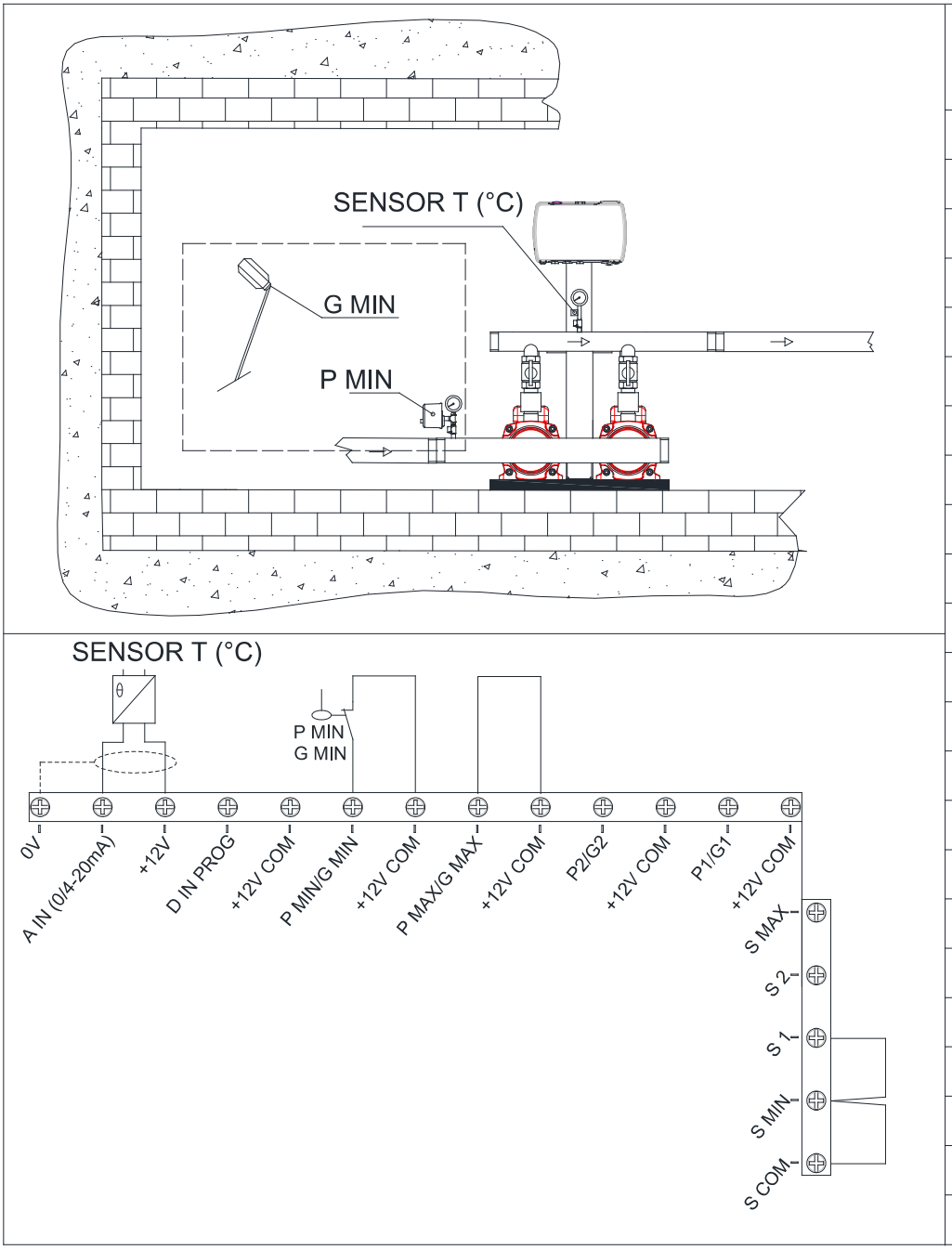
37.



Q-SMART
bS1
c01 = 1
c03 = 2
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL2B1_G_20_B-SC

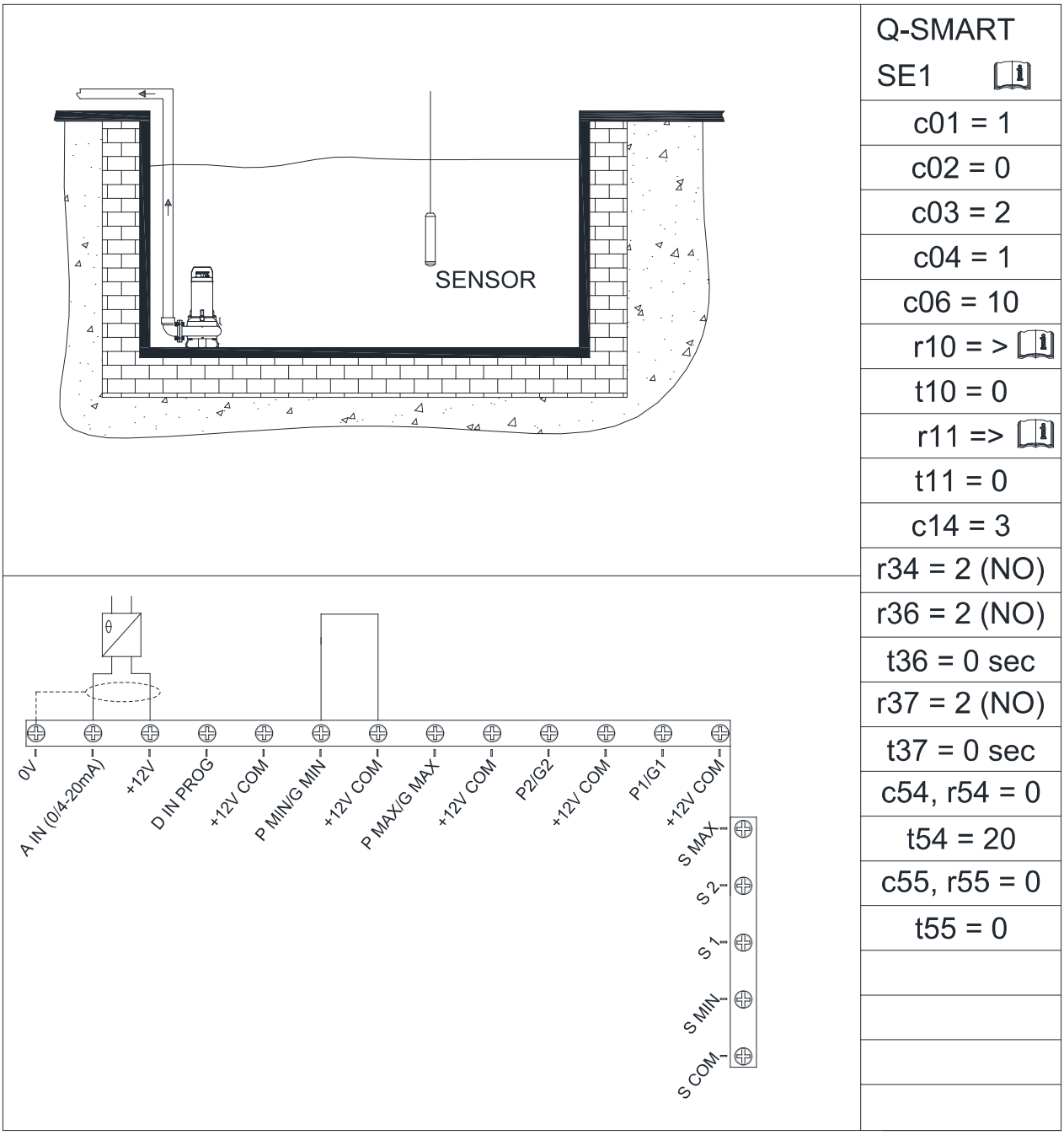
38.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 2
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART2APPL2B_G_20_B-SC

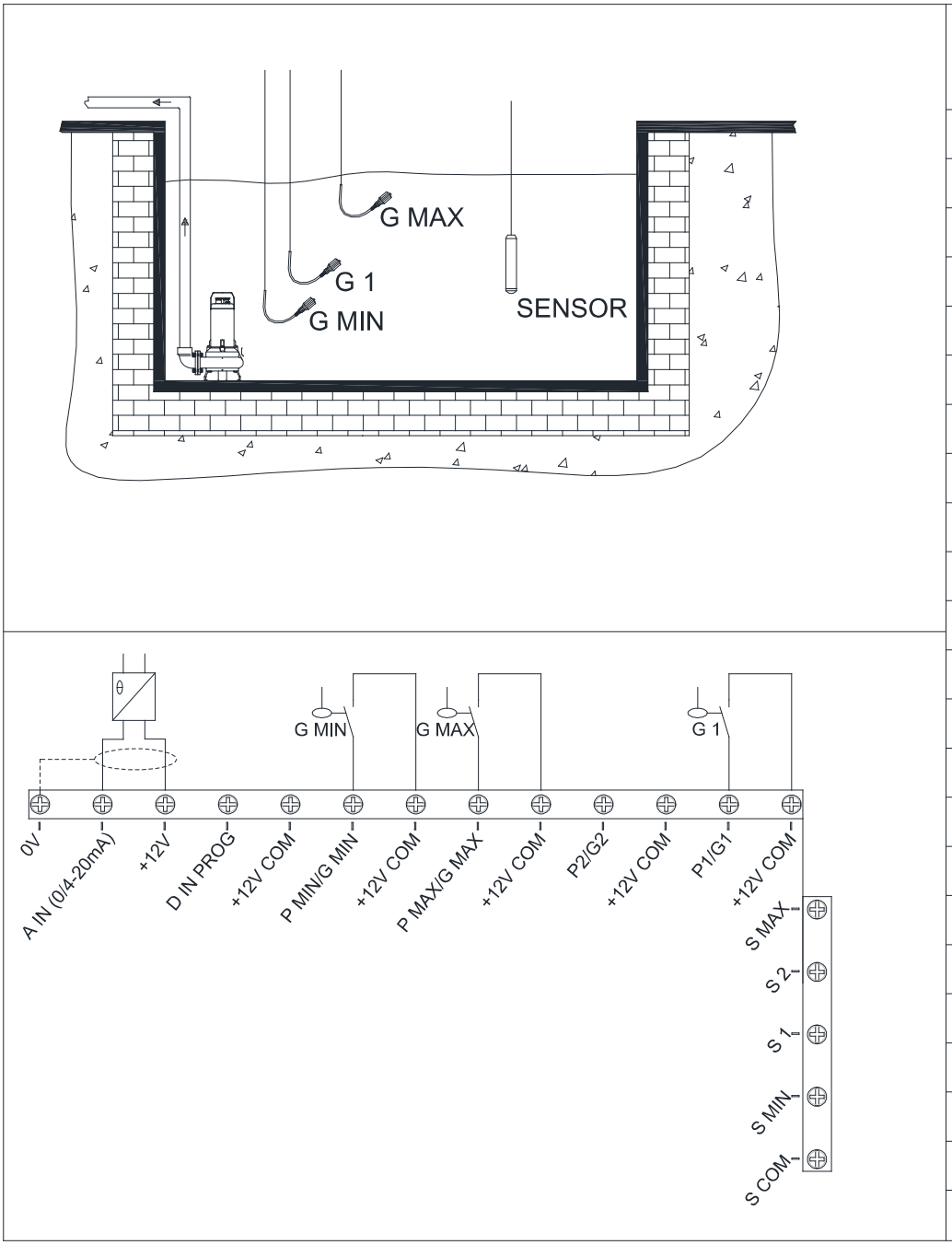
39.



Q-SMART
SE1
c01 = 1
c02 = 0
c03 = 2
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
c14 = 3
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL2S_G_20_B-SC

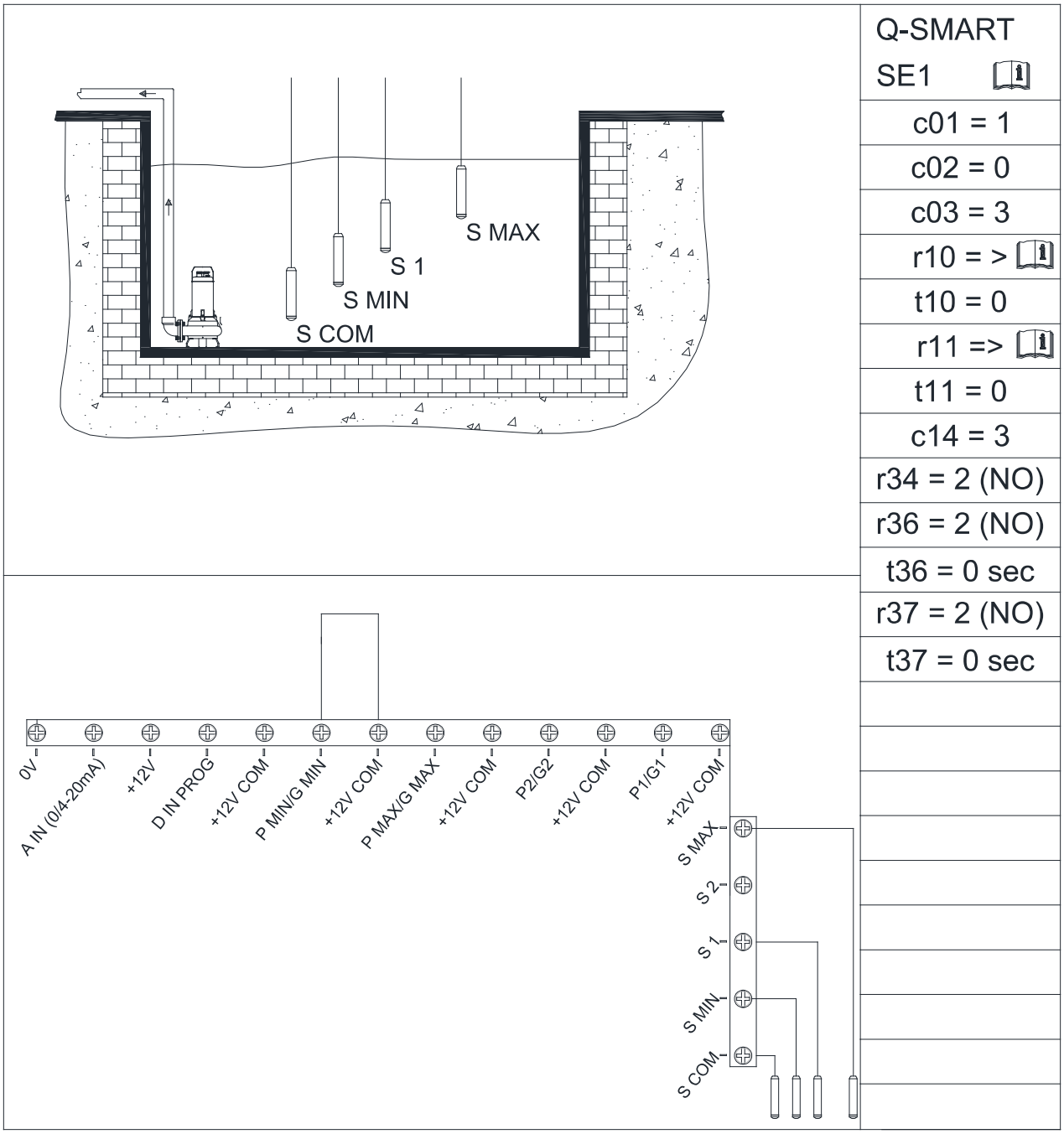
40.



Q-SMART
SE1
c01 = 1
c02 = 0
c03 = 4
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
c14 = 3
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

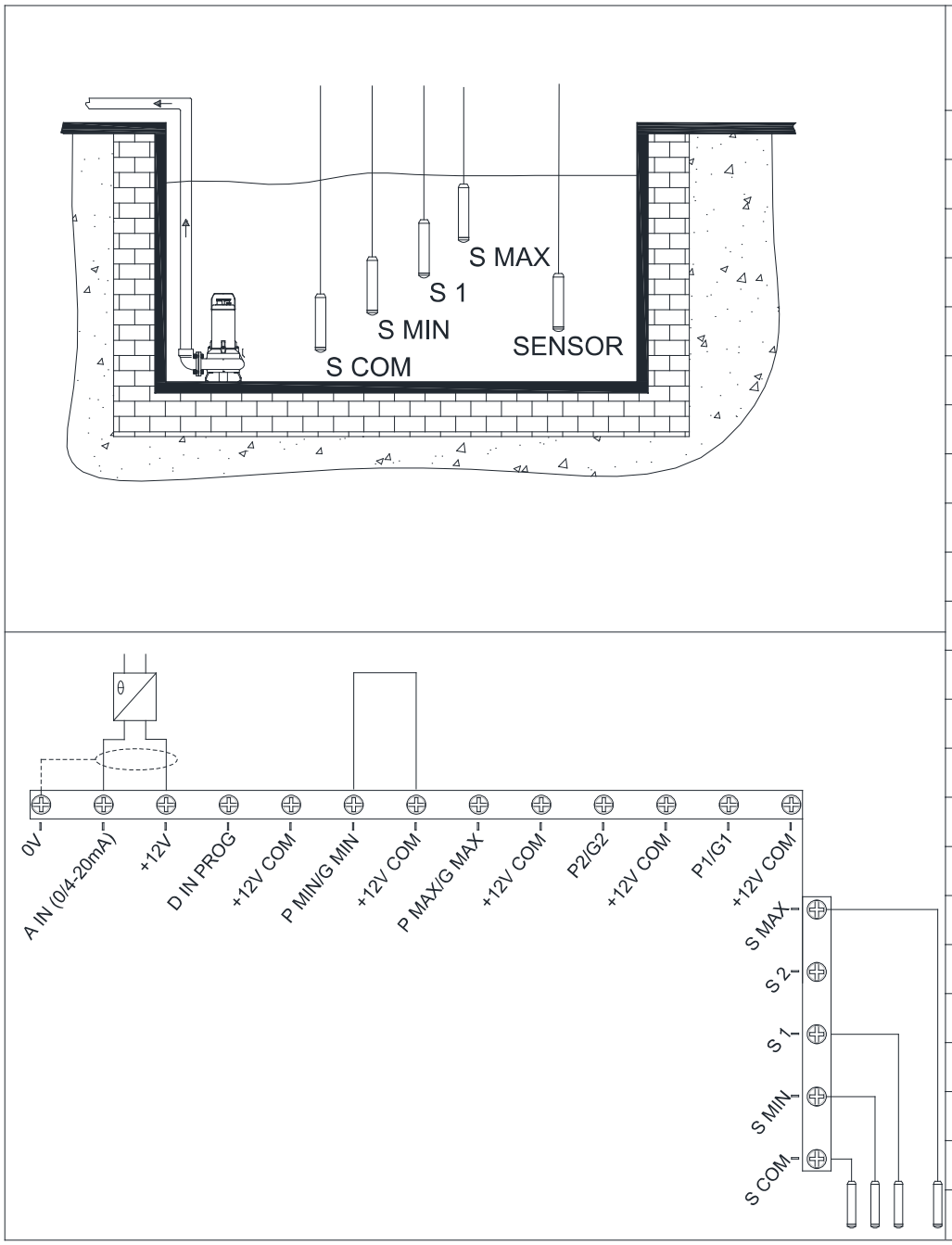
INST-QSMART1APPL4S_G_20_B-SC

41.



INST-QSMART1APPL3S_G_20_B-SC

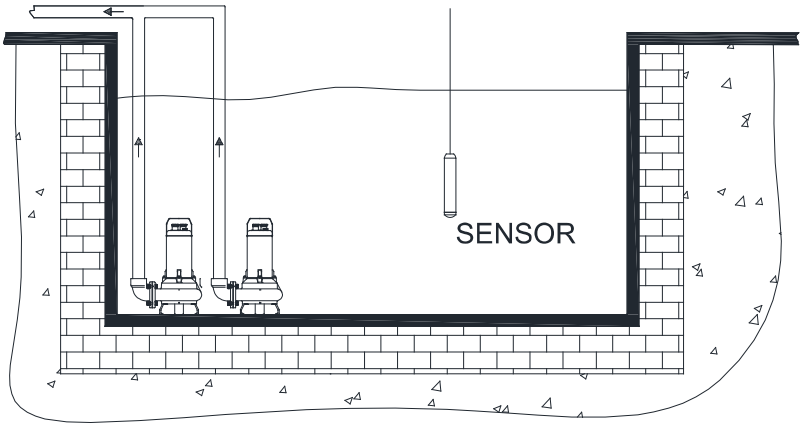
42.

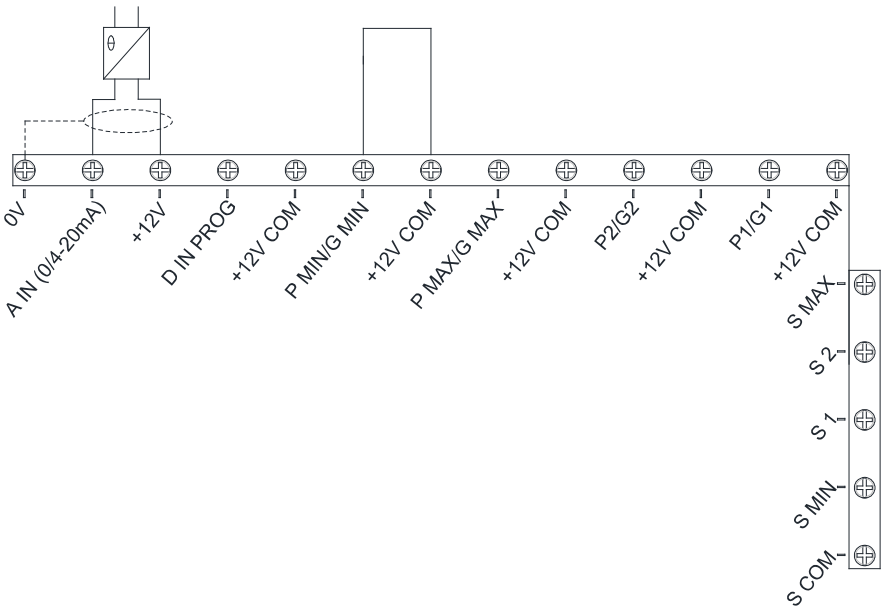


Q-SMART
SE1
c01 = 1
c02 = 0
c03 = 5
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
c14 = 3
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL5S_G_20_B-SC

43.

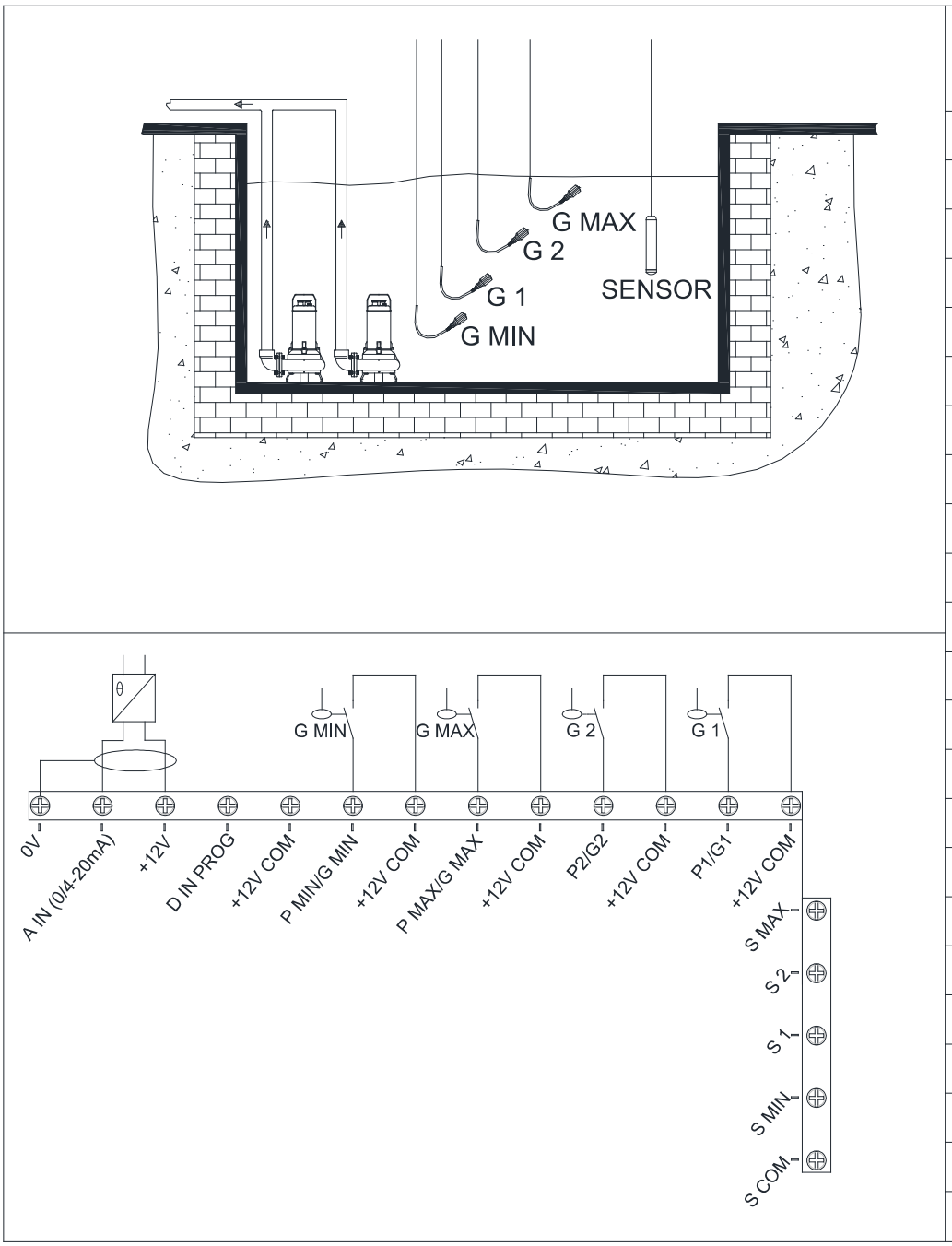




Q-SMART
SE2
c01 = 2
c02 = 0
c03 = 2
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 =>
t12 = 0
r13 =>
t13 = 0
c14 = 3
r34,r35=2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART2APPL2S_G_20_B-SC

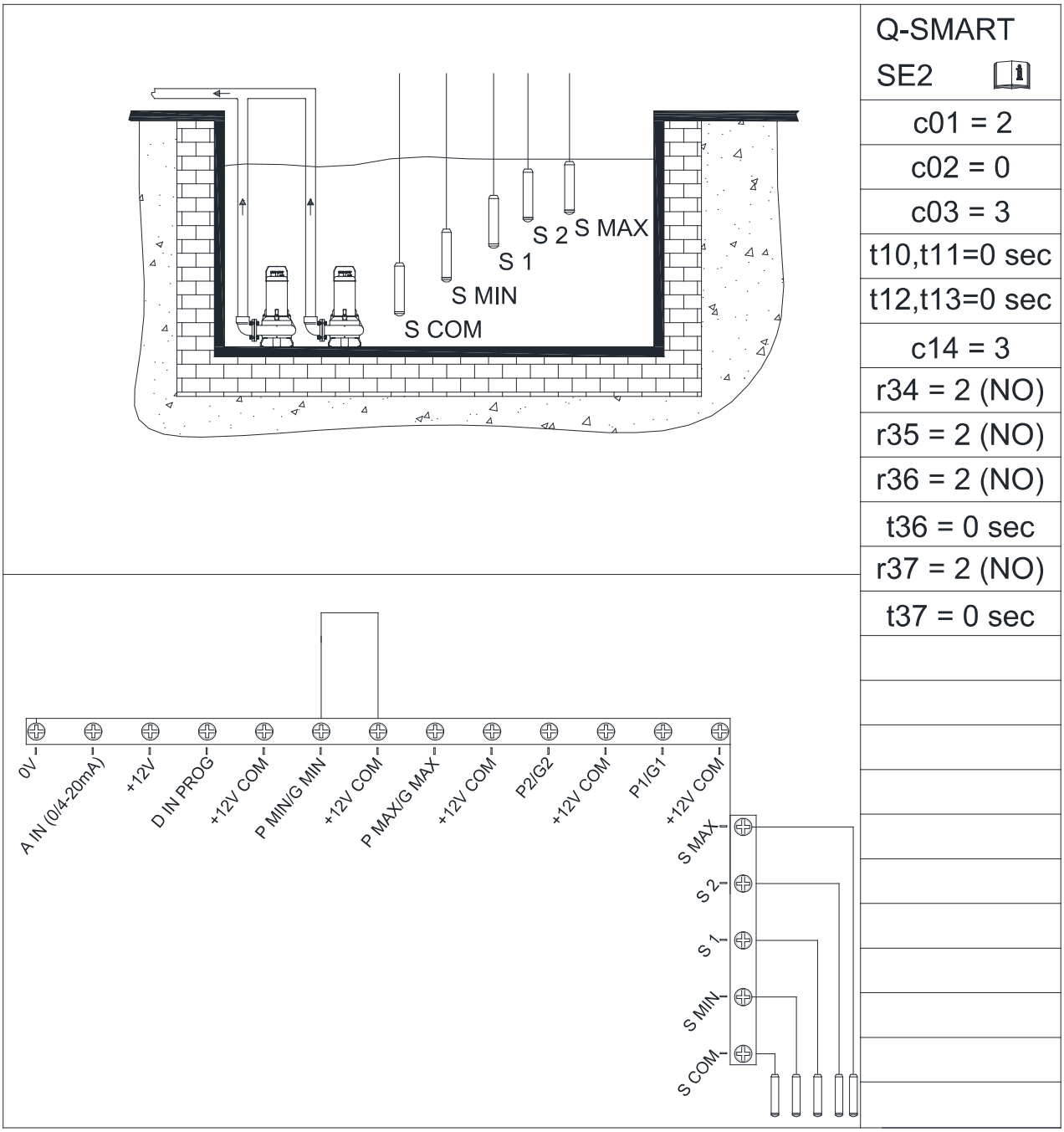
44.



Q-SMART
SE2
c01 = 2
c02 = 0
c03 = 4
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
c14 = 3
r34,r35=2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART2APPL4S_G_20_B-SC

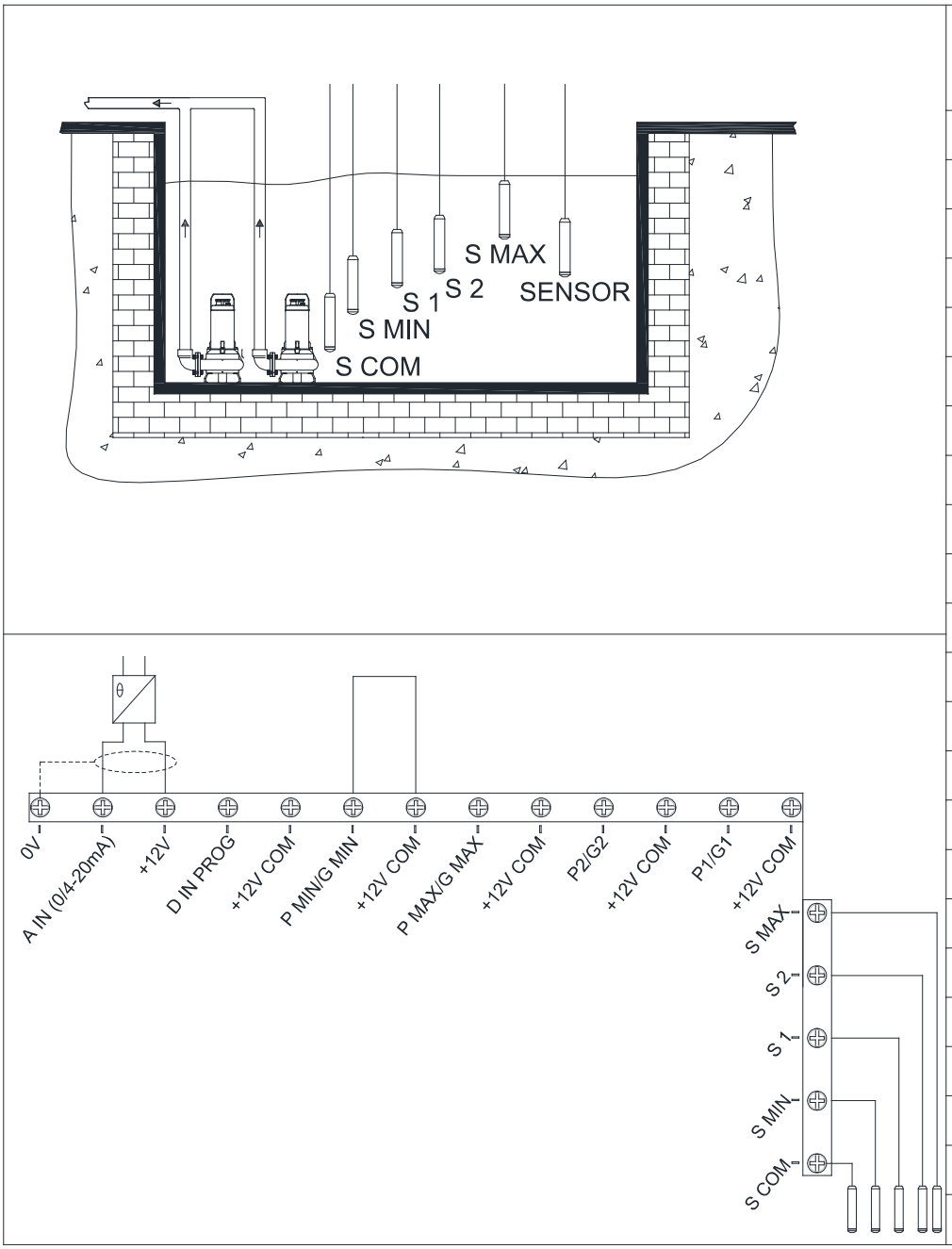
45.



Q-SMART
SE2
c01 = 2
c02 = 0
c03 = 3
t10,t11=0 sec
t12,t13=0 sec
c14 = 3
r34 = 2 (NO)
r35 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec

INST-QSMART1APPL3S_G_20_B-SC

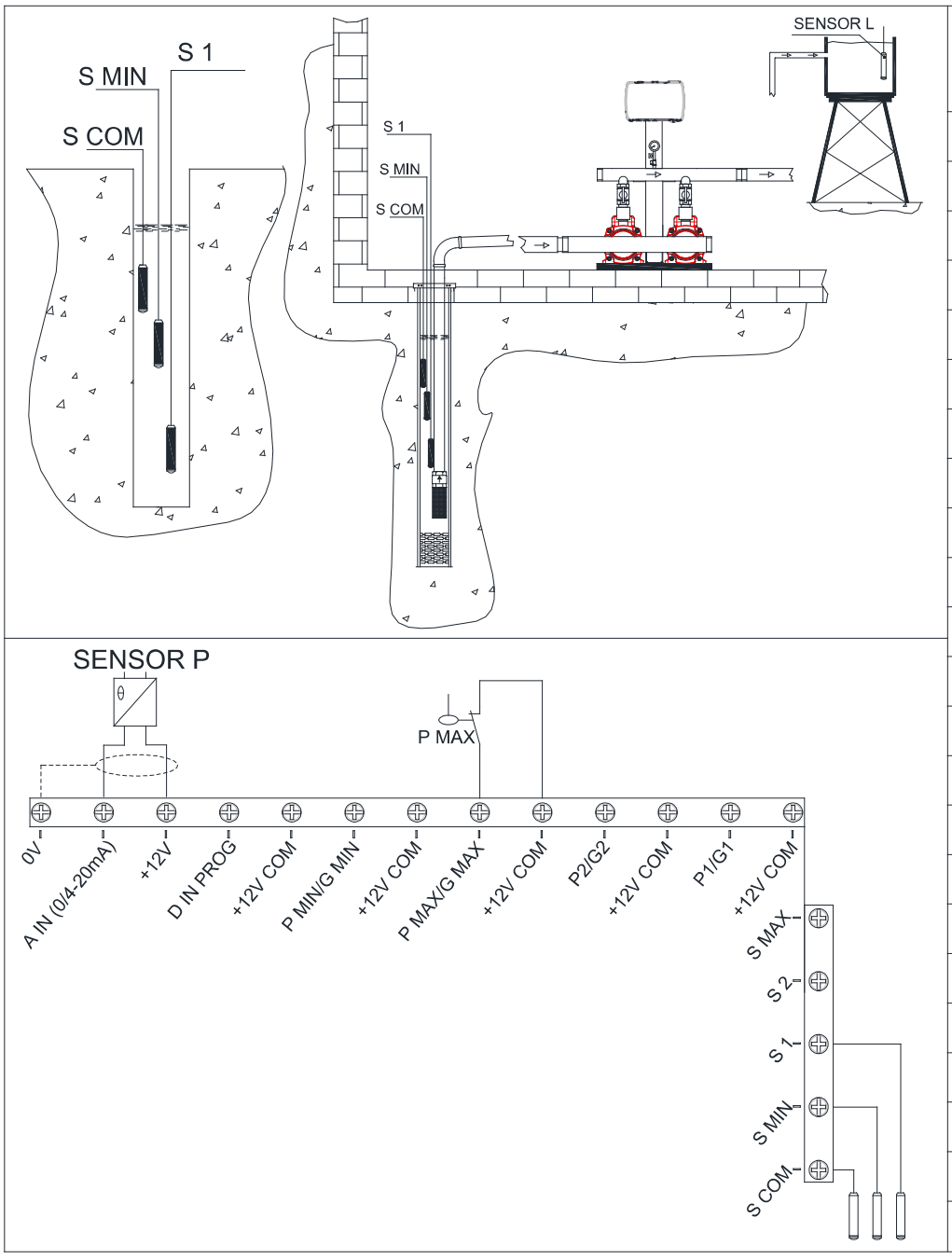
46.



Q-SMART
SE2
c01 = 2
c02 = 0
c03 = 5
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 =>
t12 = 0
r13 =>
t13 = 0
c14 = 3
r34,r35=2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART2APPL5S_G_20_B-SC

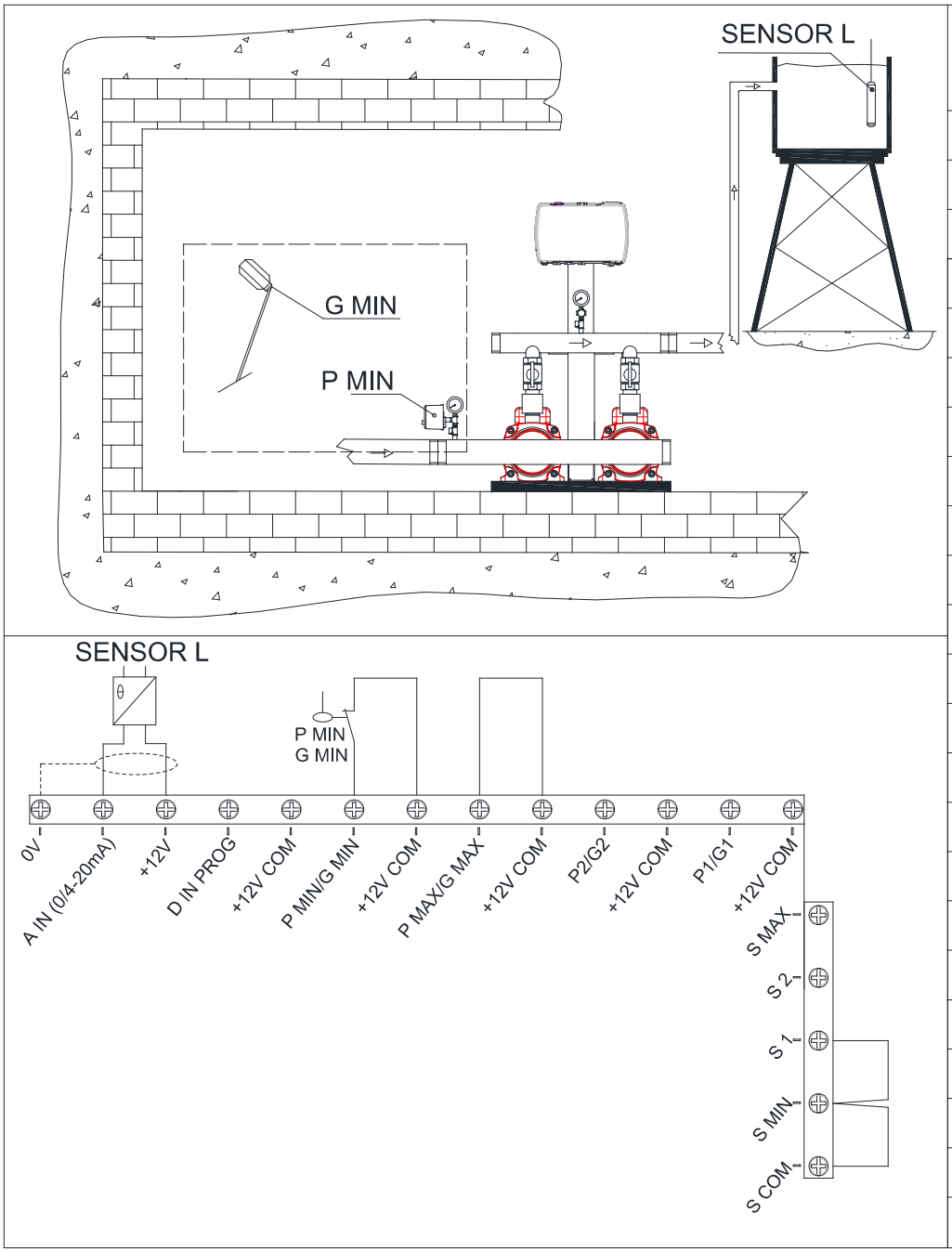
47.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 3
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART2APPL3B2_G_20_B-SC

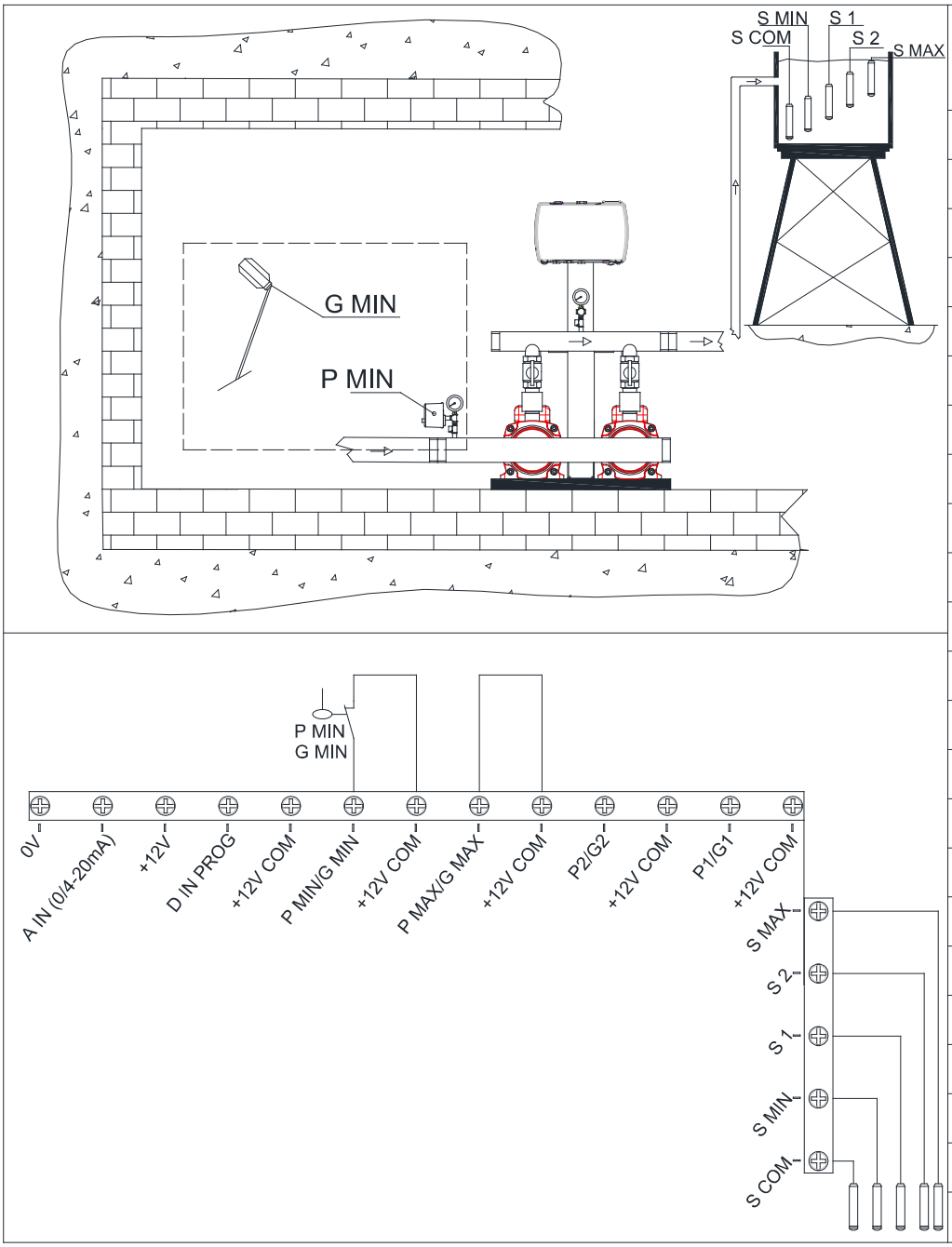
48.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 3
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART2APPL3B_G_20_B-SC

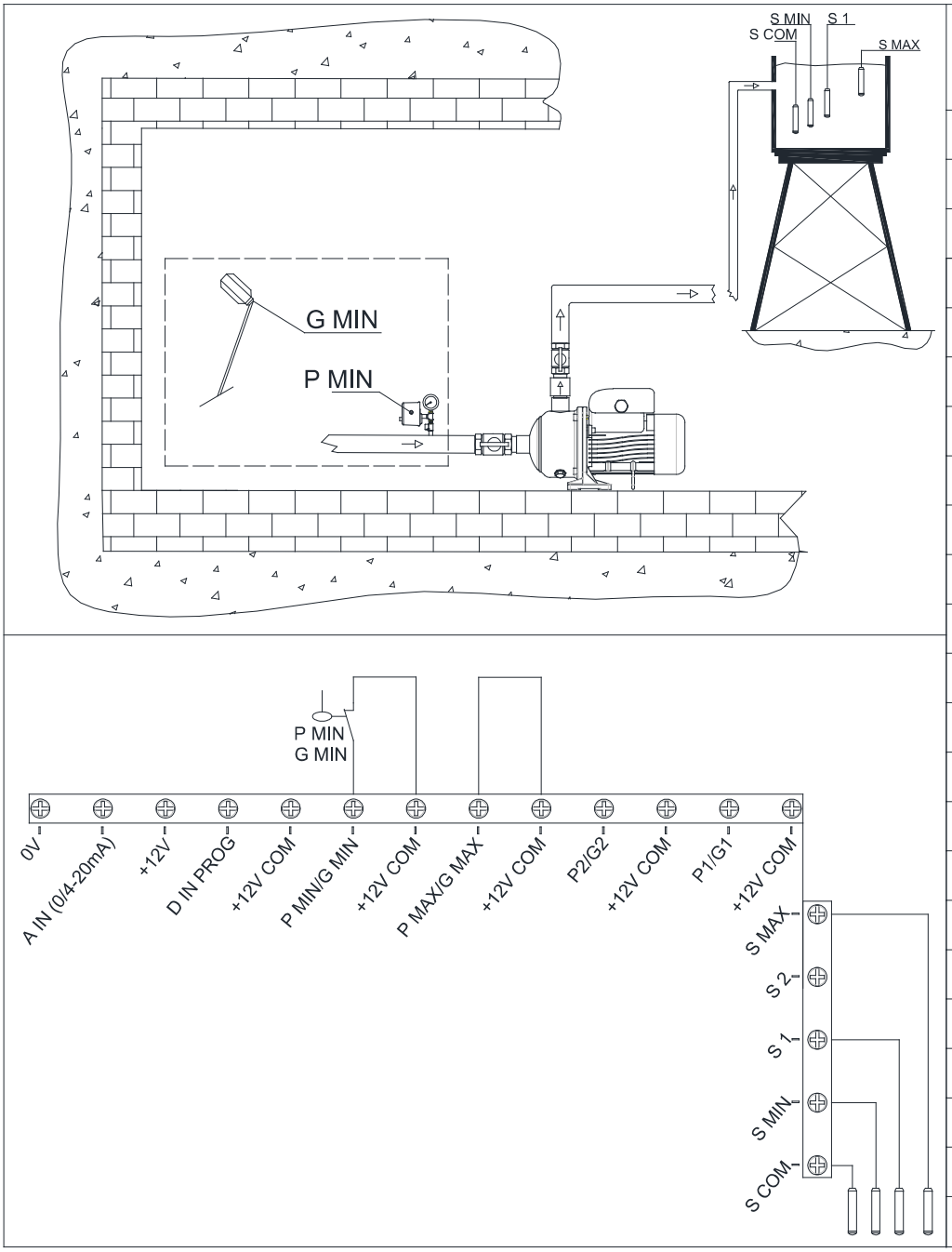
49.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 5
t10,t11=0 sec
t12,t13=0 sec
r34 = 1 (NC)
r35 = 1 (NC)
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 0
t53 = 0 sec

INST-QSMART2APPL5B_G_20_B-SC

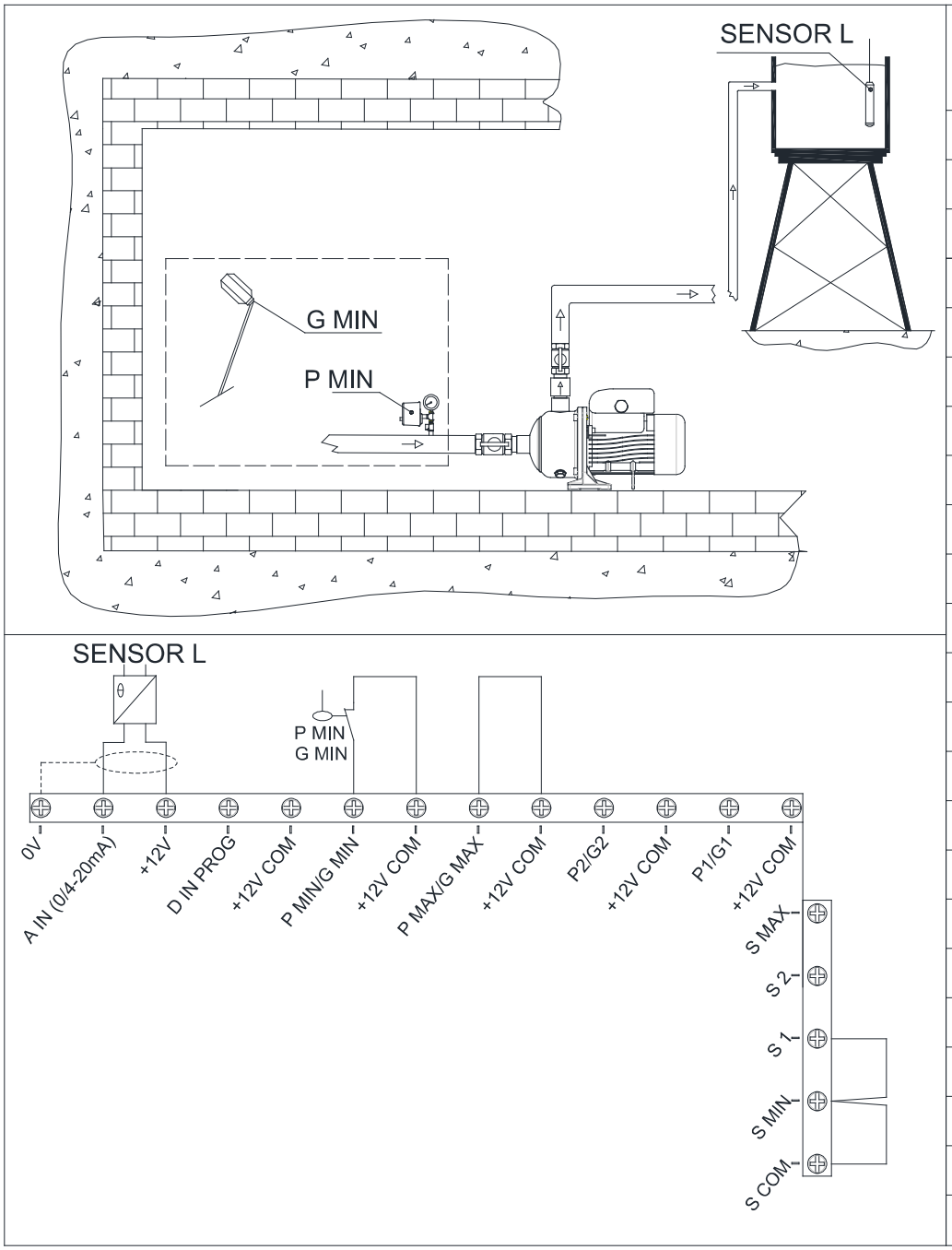
50.



Q-SMART
bS1
c01 = 1
c02 = 0
c03 = 5
t10 = 0
t11 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 0
t53 = 0 sec

INST-QSMART1APPL5B1_G_20_B-SC

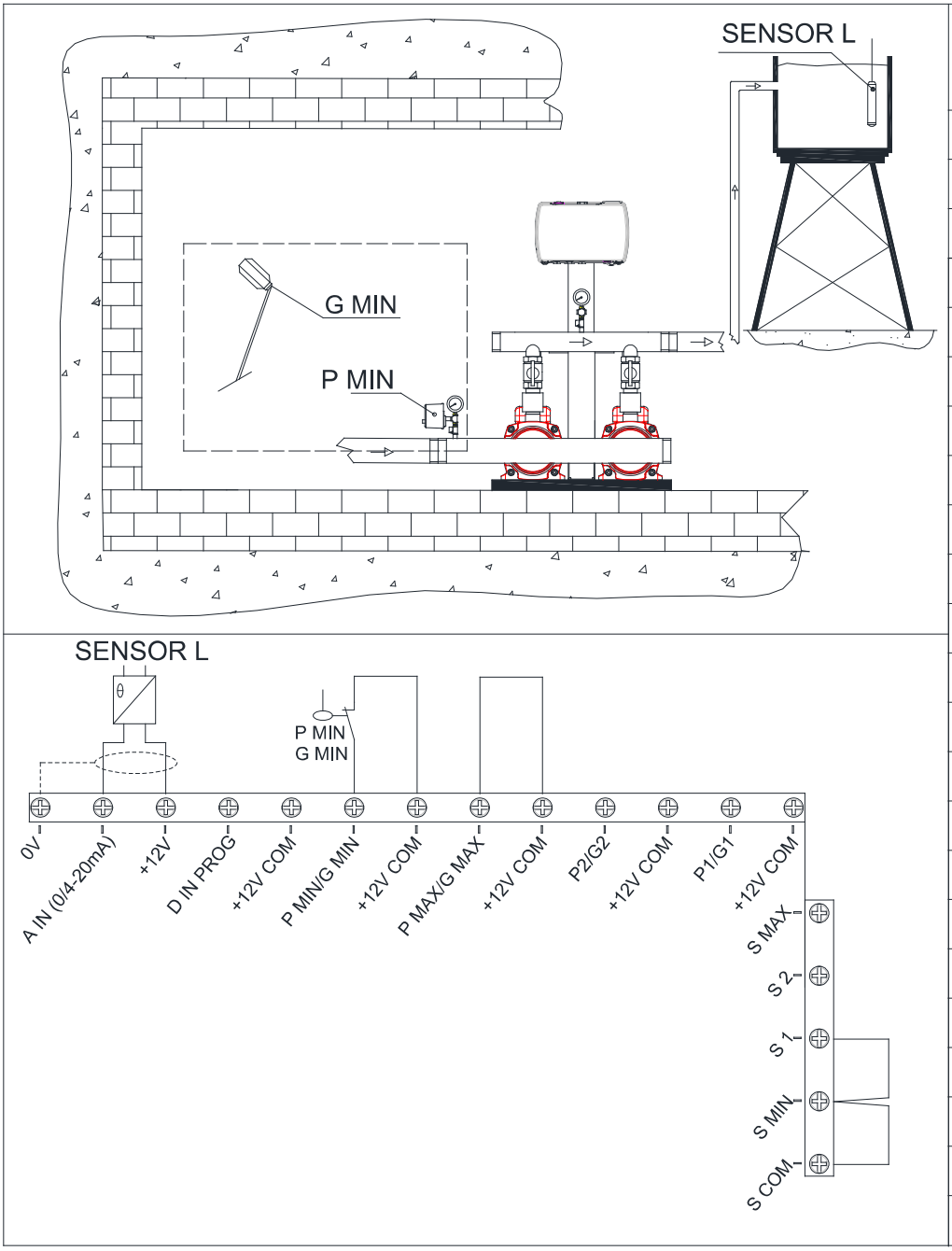
51.



Q-SMART
bS1
c01 = 1
c02 = 0
c03 = 3
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL3B_G_20_B-SC

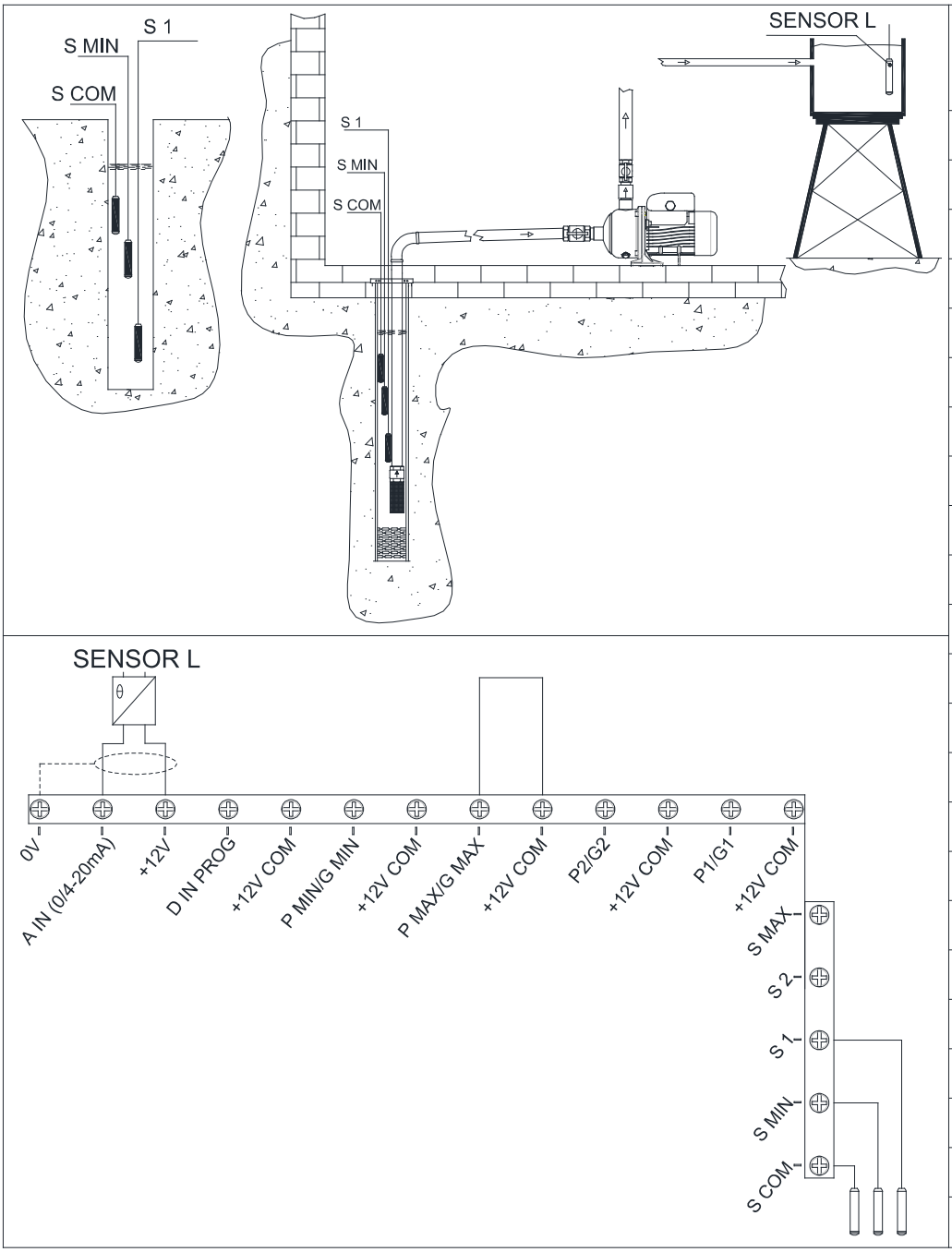
52.



Q-SMART
bS2
c01 = 2
c02 = 0
c03 = 3
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 = >
t12 = 0
r13 =>
t13 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART2APPL3B_G_20_B-SC

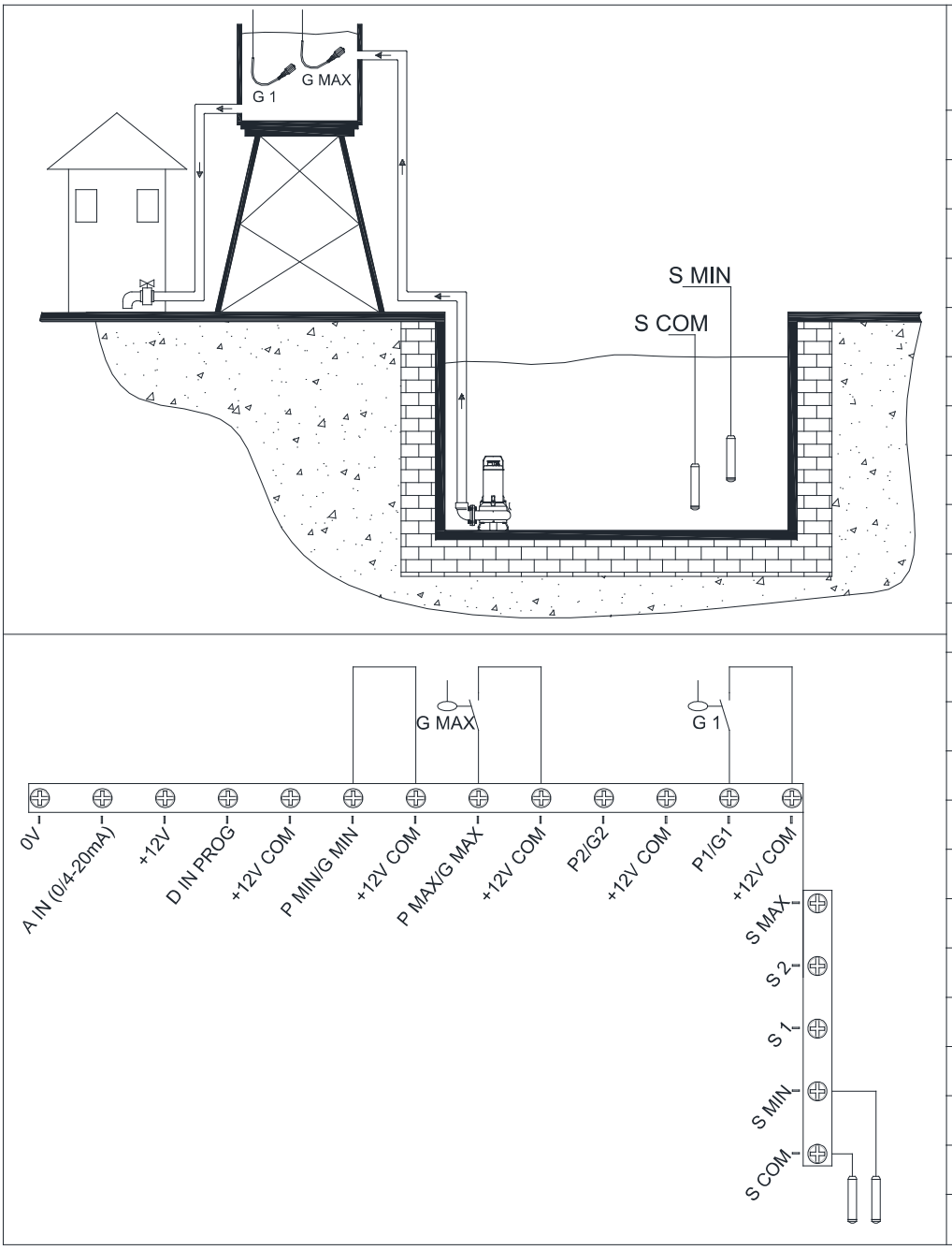
53.



Q-SMART
bS1
c01 = 1
c02 = 0
c03 = 3
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r36 = 1 (NC)
t36 = 0 sec
r37 = 1 (NC)
t37 = 0 sec
c53 = 1
t53 = 0 sec
c54, r54 = 0
t54 = 20
c55, r55 = 0
t55 = 0

INST-QSMART1APPL3B2_G_20_B-SC

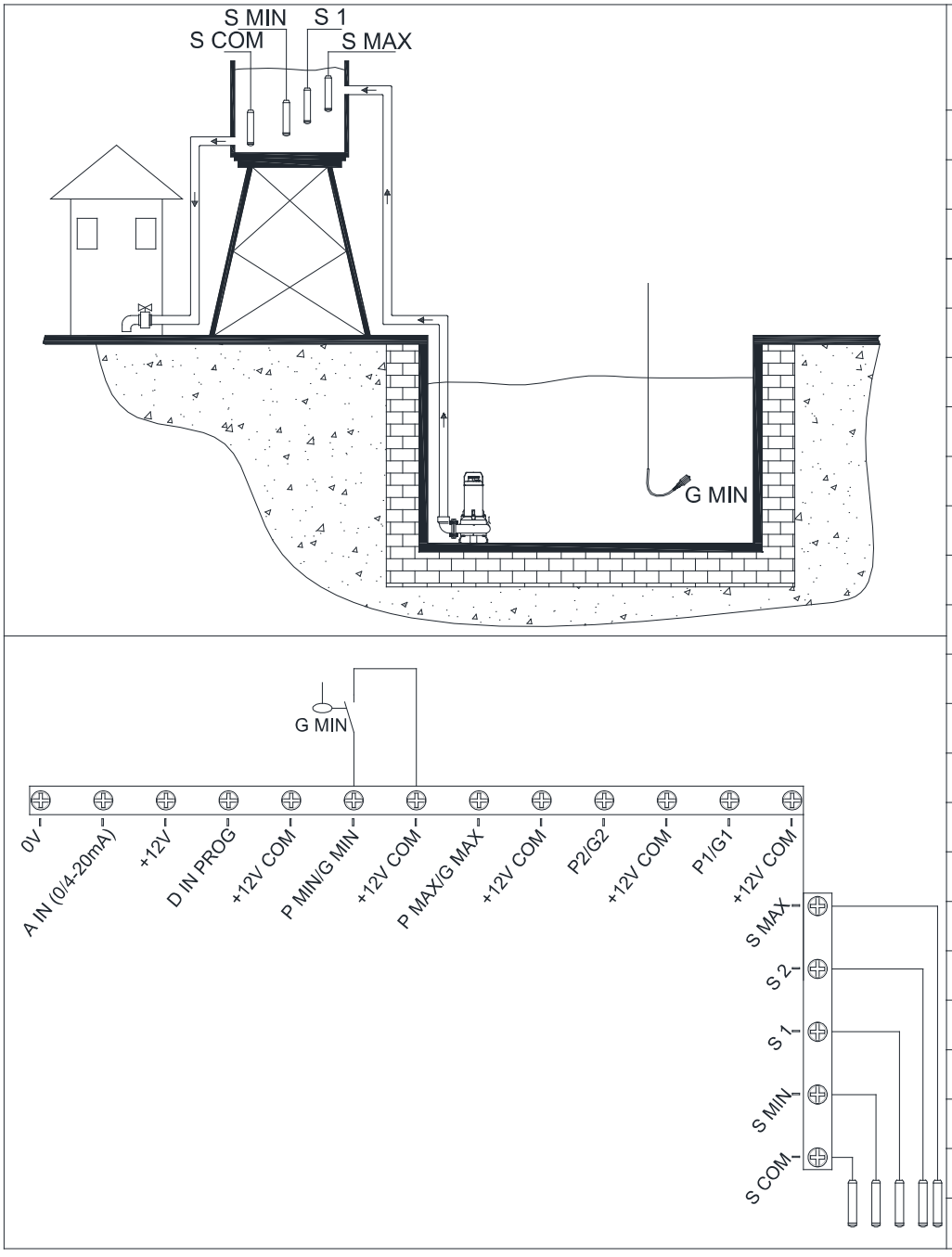
54.



Q-SMART
SE1
c01 = 1
c02 = 1
c03 = 1
t10 = 0
t11 = 0
c14 = 3
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 1

INST-QSMART1APPL1L_G_20_B-SC

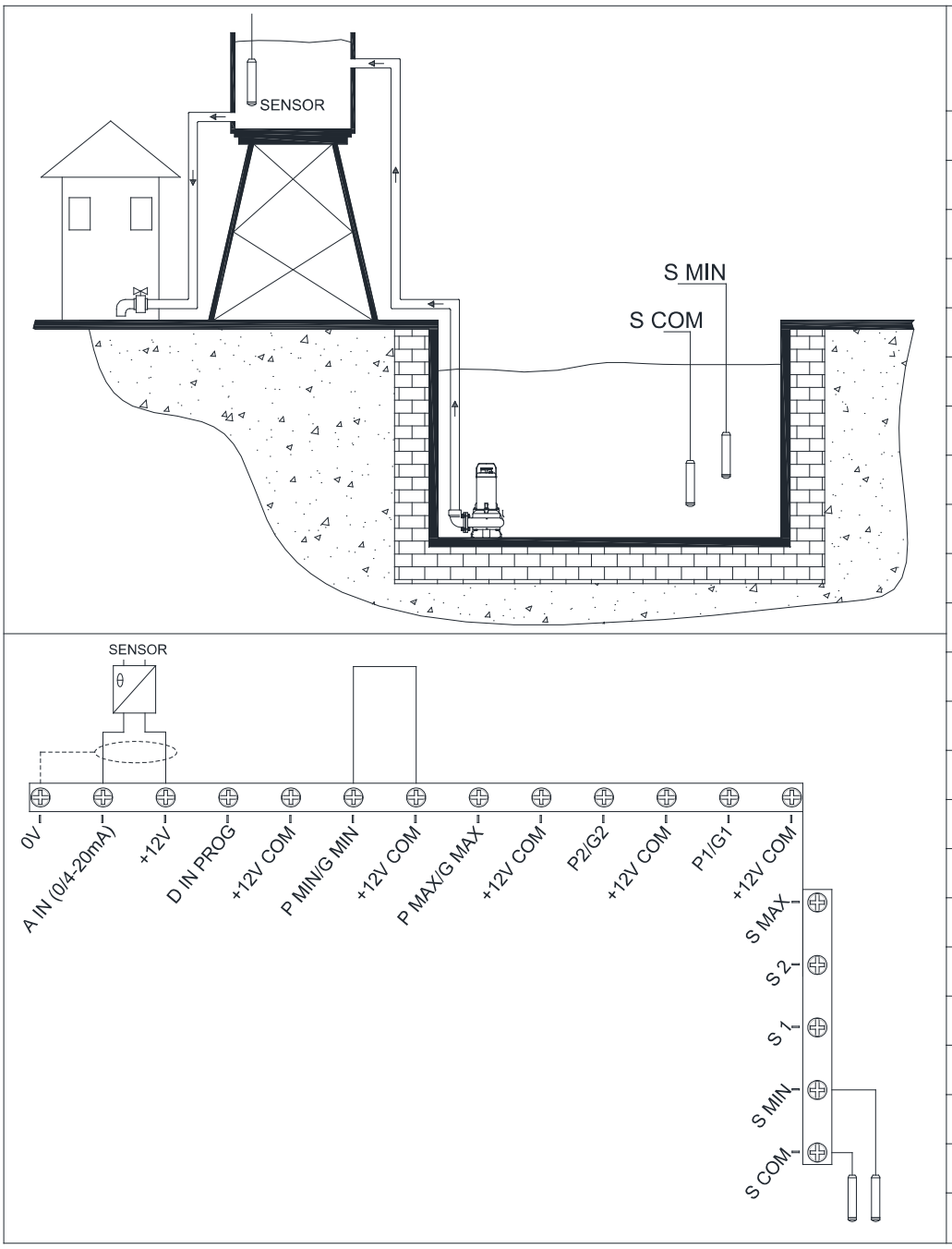
55.



Q-SMART
SE1
c01 = 1
c02 = 1
c03 = 3
t10 = 0
t11 = 0
c14 = 3
r34 = 2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 0

INST-QSMART1APPL3L_G_20_B-SC

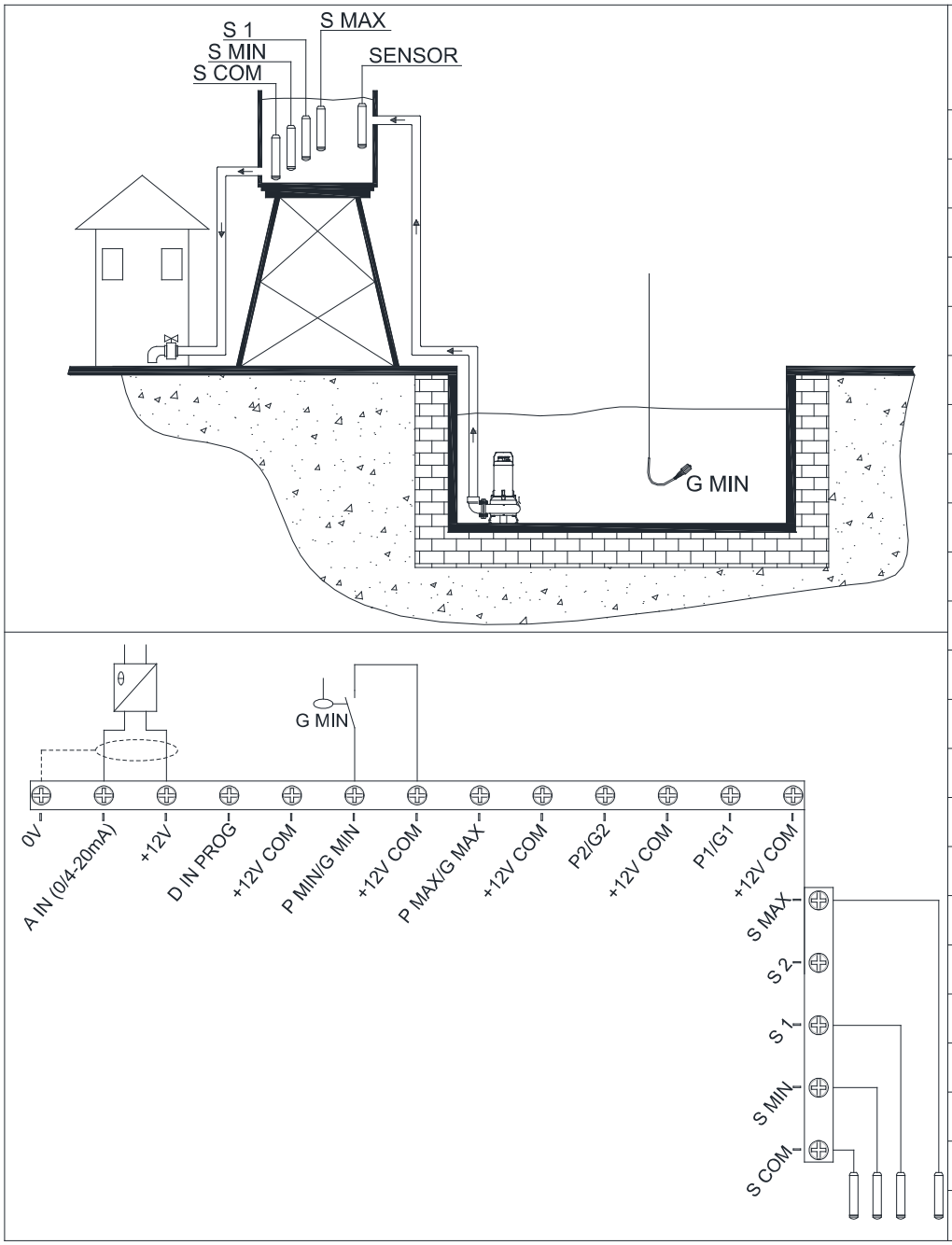
56.



Q-SMART
SE1
c01 = 1
c02 = 1
c03 = 2
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 =>
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 1
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART1APPL2L_G_20_B-SC

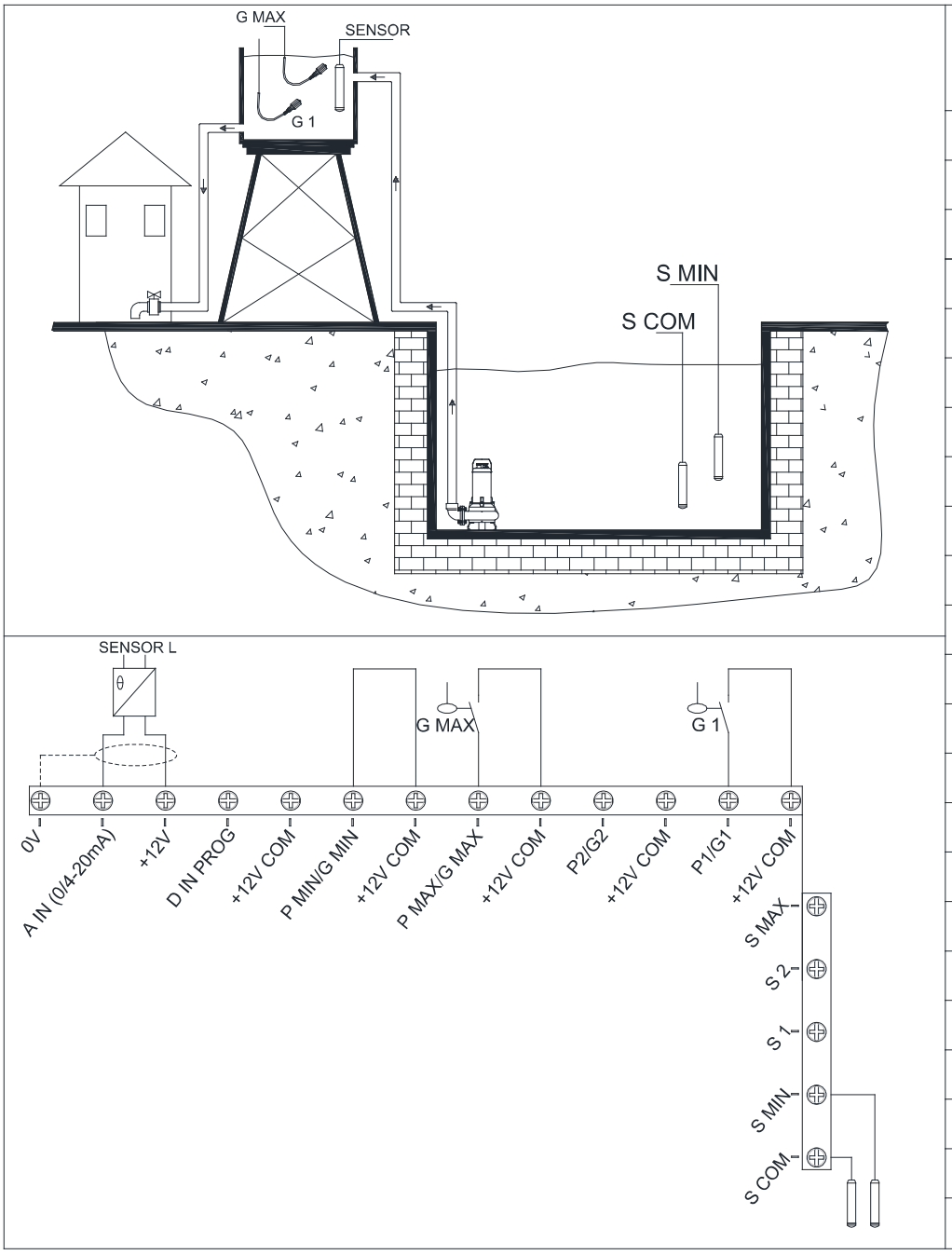
57.



Q-SMART
SE1
c01 = 1
c02 = 1
c03 = 5
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
c14 = 1
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 0
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART1APPL5L_G_20_B-SC

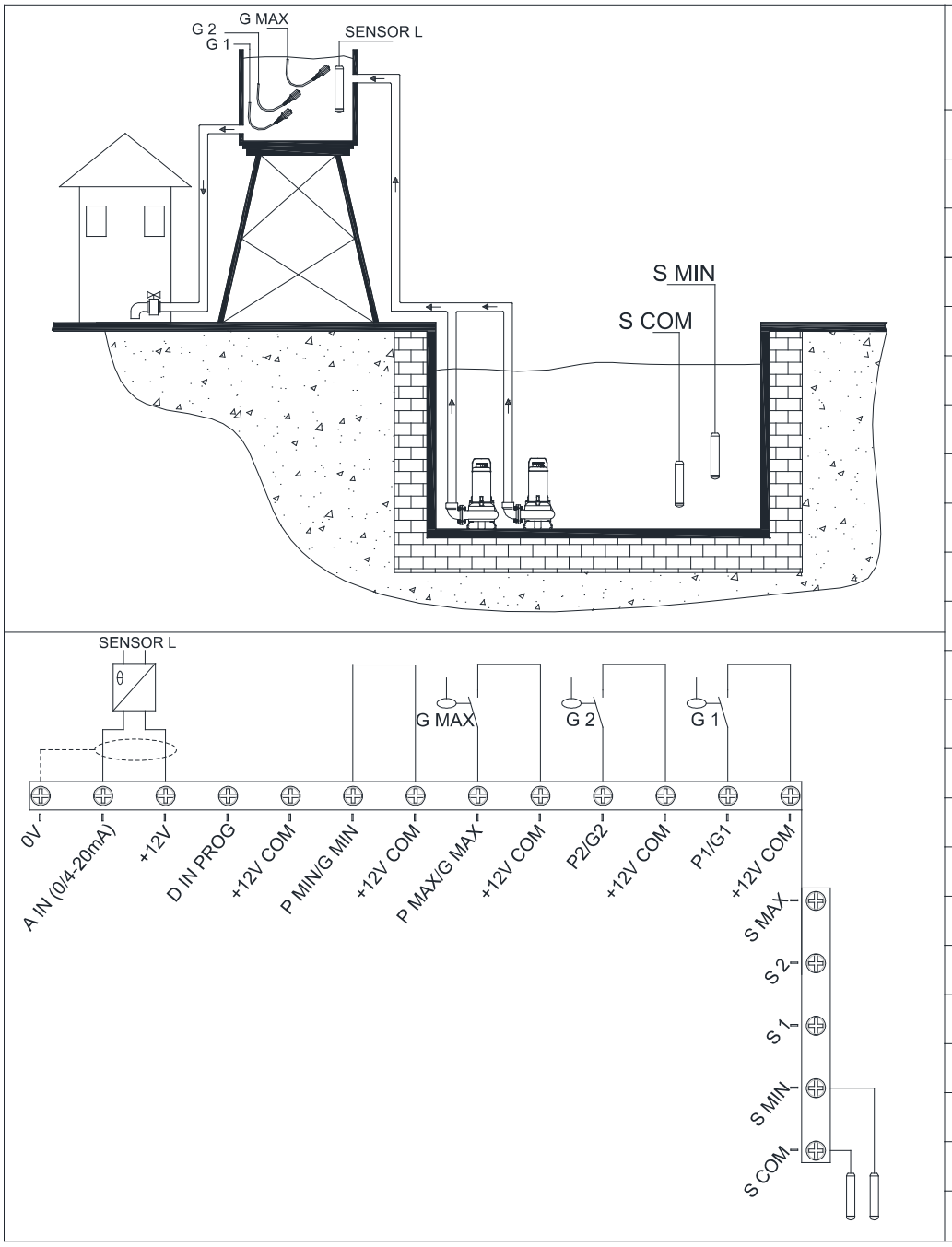
58.



Q-SMART
SE1
c01 = 1
c02 = 1
c03 = 4
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
c14 = 3
r34 = 2 (NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 1
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART1APPL4L_G_20_B-SC

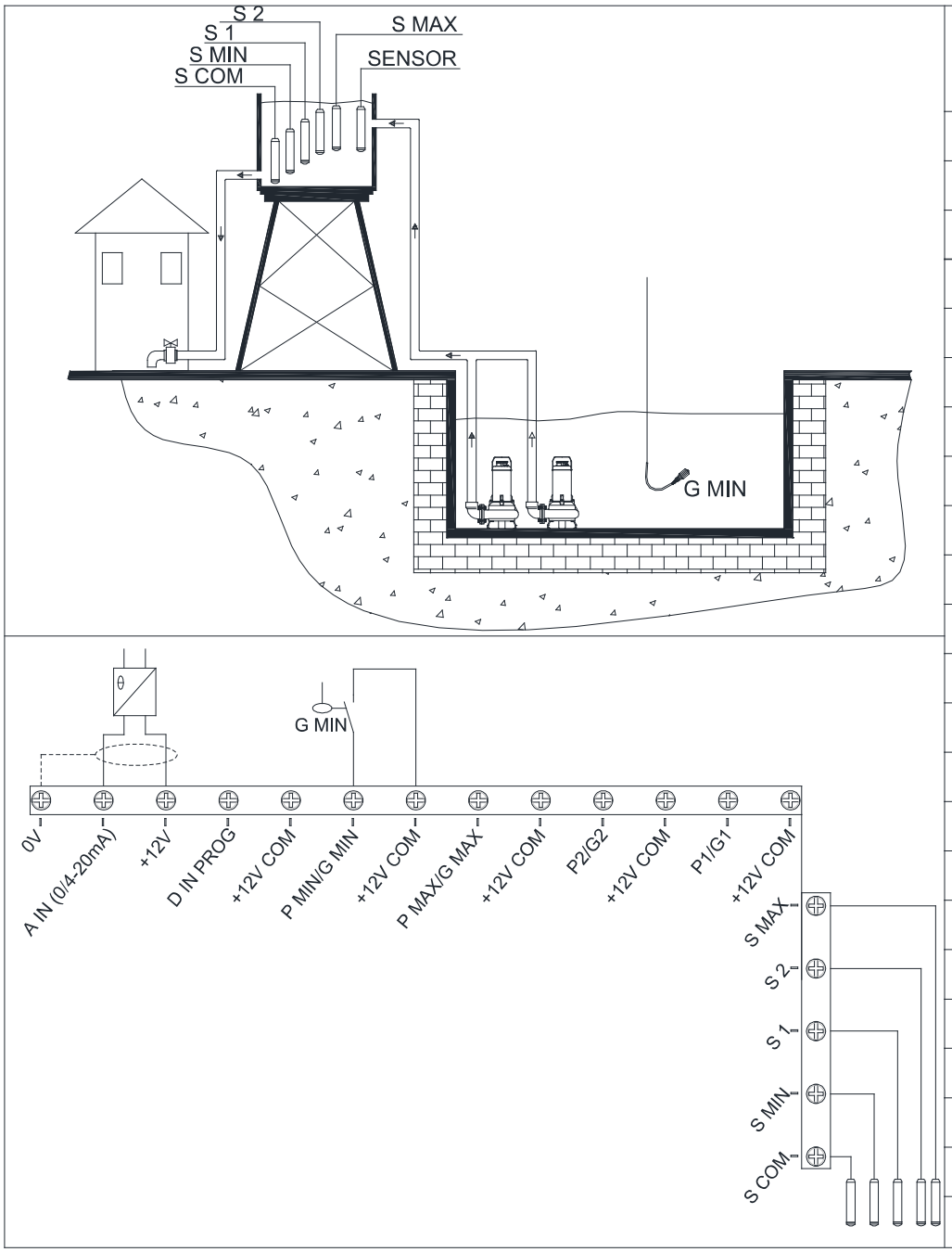
59.



Q-SMART
SE2
c01 = 2
c02 = 1
c03 = 4
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 =>
t12 = 0
r13 =>
t13 = 0
c14 = 3
r34,r35=2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 1
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART2APPL4L_G_20_B-SC

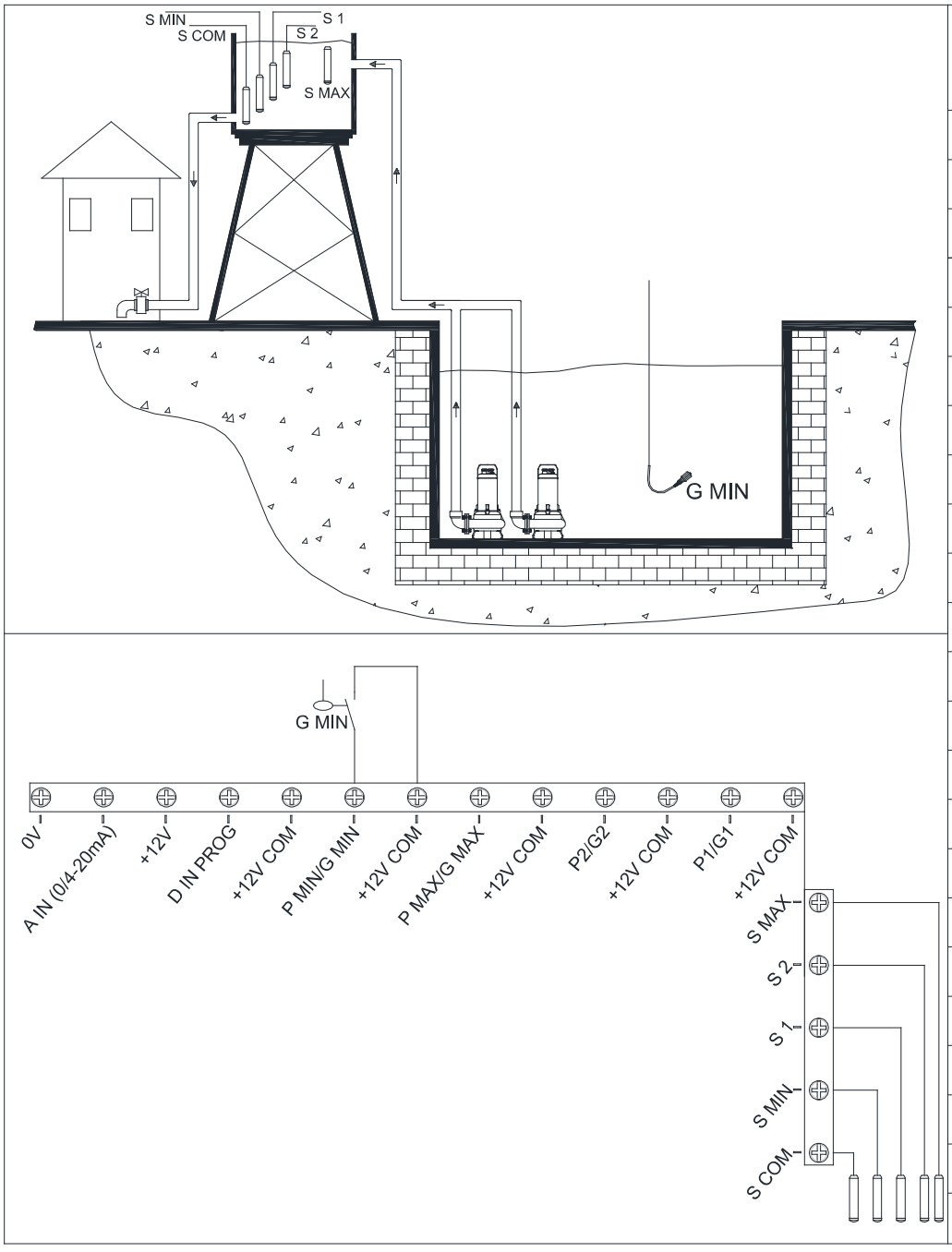
60.



Q-SMART
SE2
c01 = 2
c02 = 1
c03 = 5
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 =>
t12 = 0
r13 =>
t13 = 0
c14 = 1
r34,r35=2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 0
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART2APPL5L_G_20_B-SC

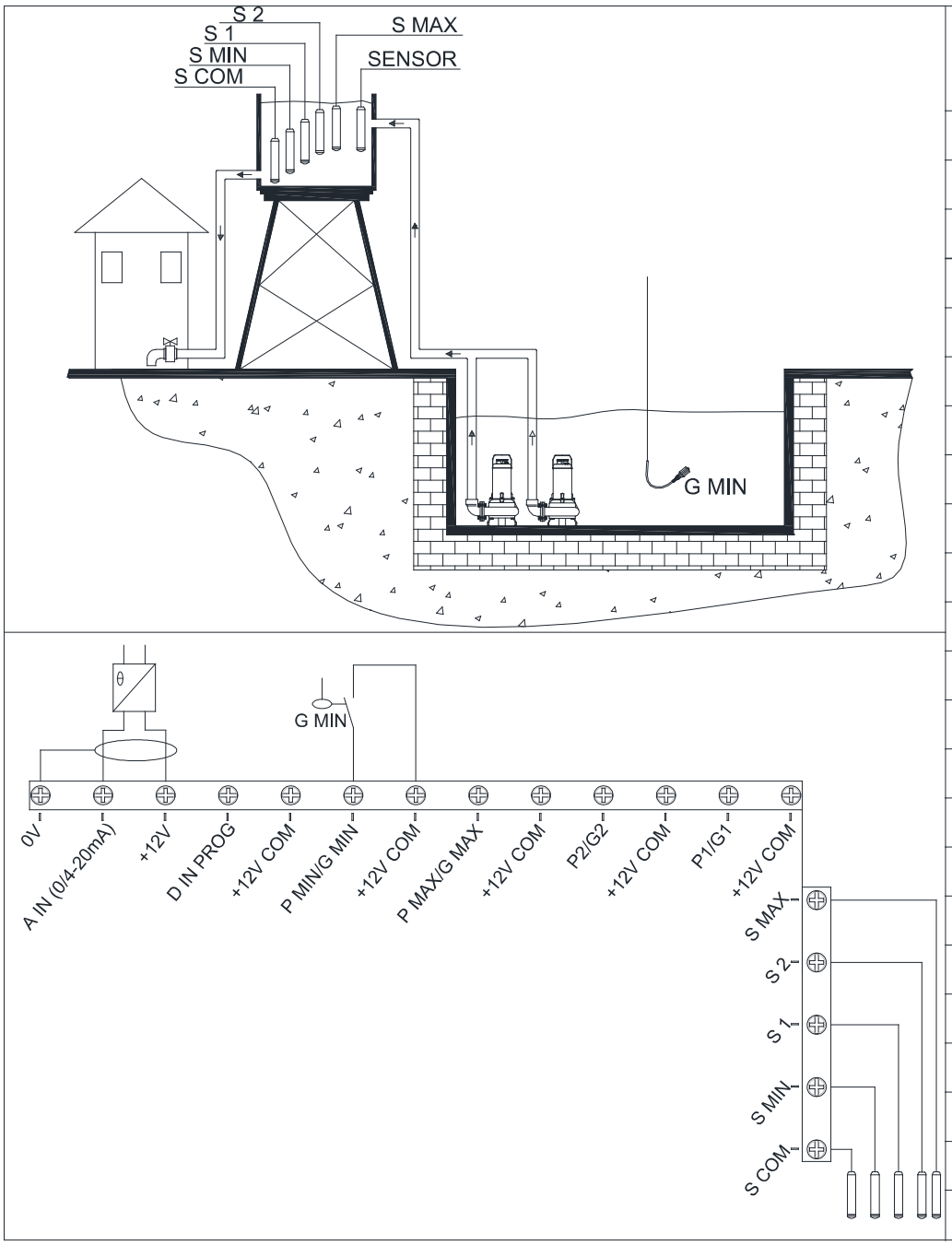
61.



Q-SMART
SE2
c01 = 2
c02 = 1
c03 = 3
t10 = 0
t11 = 0
t12 = 0
t13 = 0
c14 = 3
r34,r35=2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 0

INST-QSMART2APPL3L_G_20_B-SC

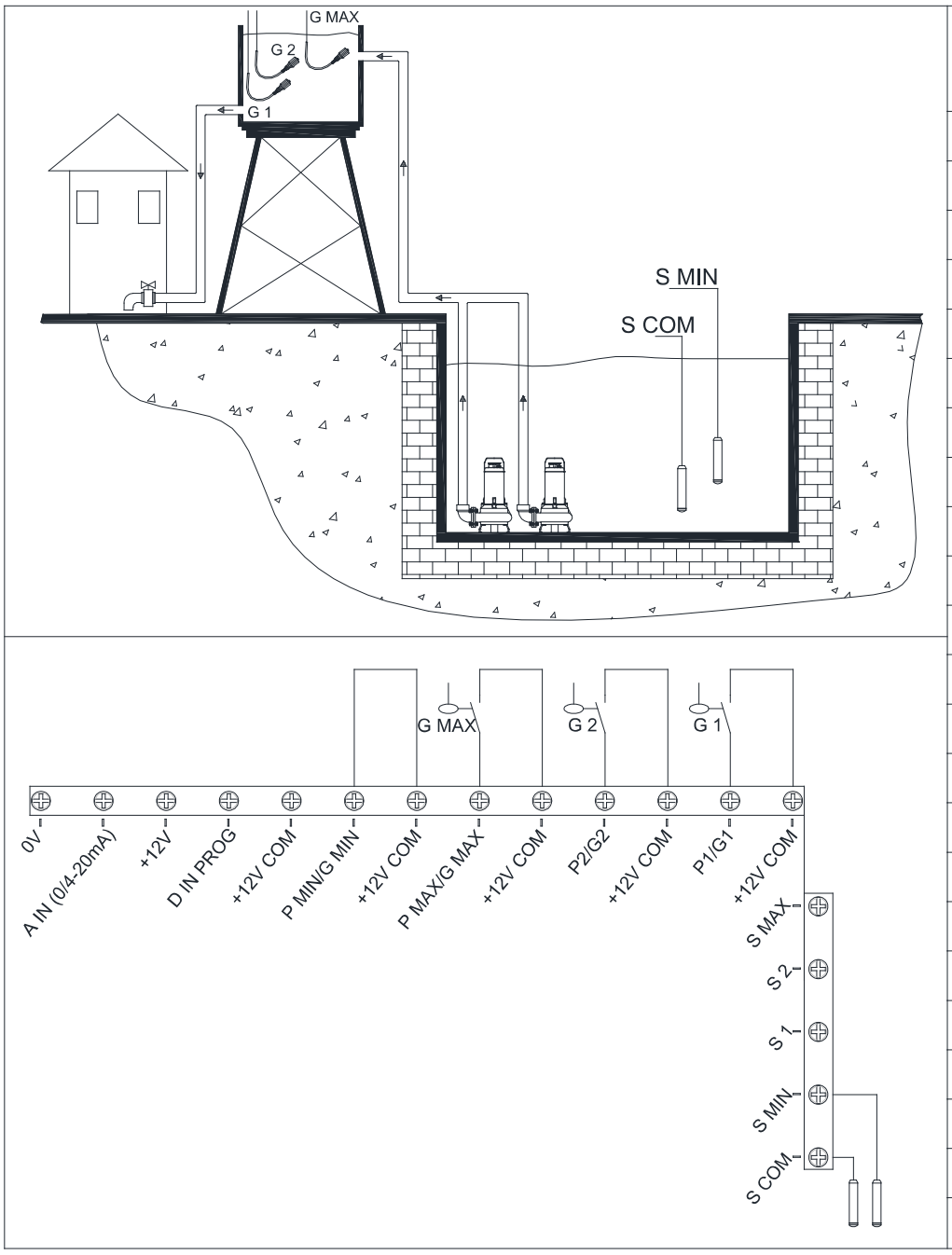
62.



Q-SMART
SE2
c01 = 2
c02 = 1
c03 = 5
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 =>
t12 = 0
r13 =>
t13 = 0
c14 = 1
r34,r35=2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 0
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART2APPL5L_G_20_B-SC

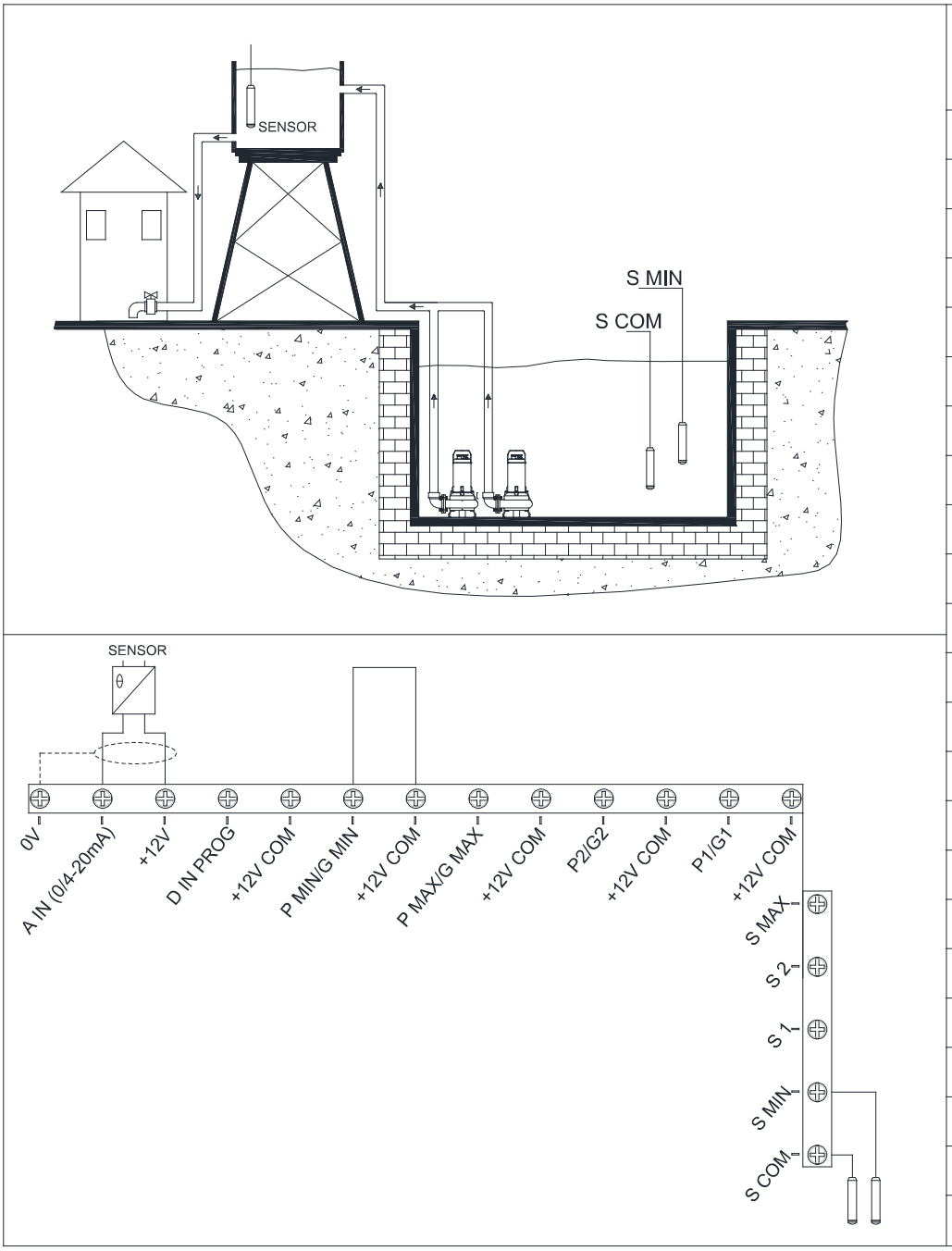
63.



Q-SMART
SE2
c01 = 2
c02 = 1
c03 = 1
t10 = 0
t11 = 0
t12 = 0
t13 = 0
c14 = 3
r34,r35=2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 1

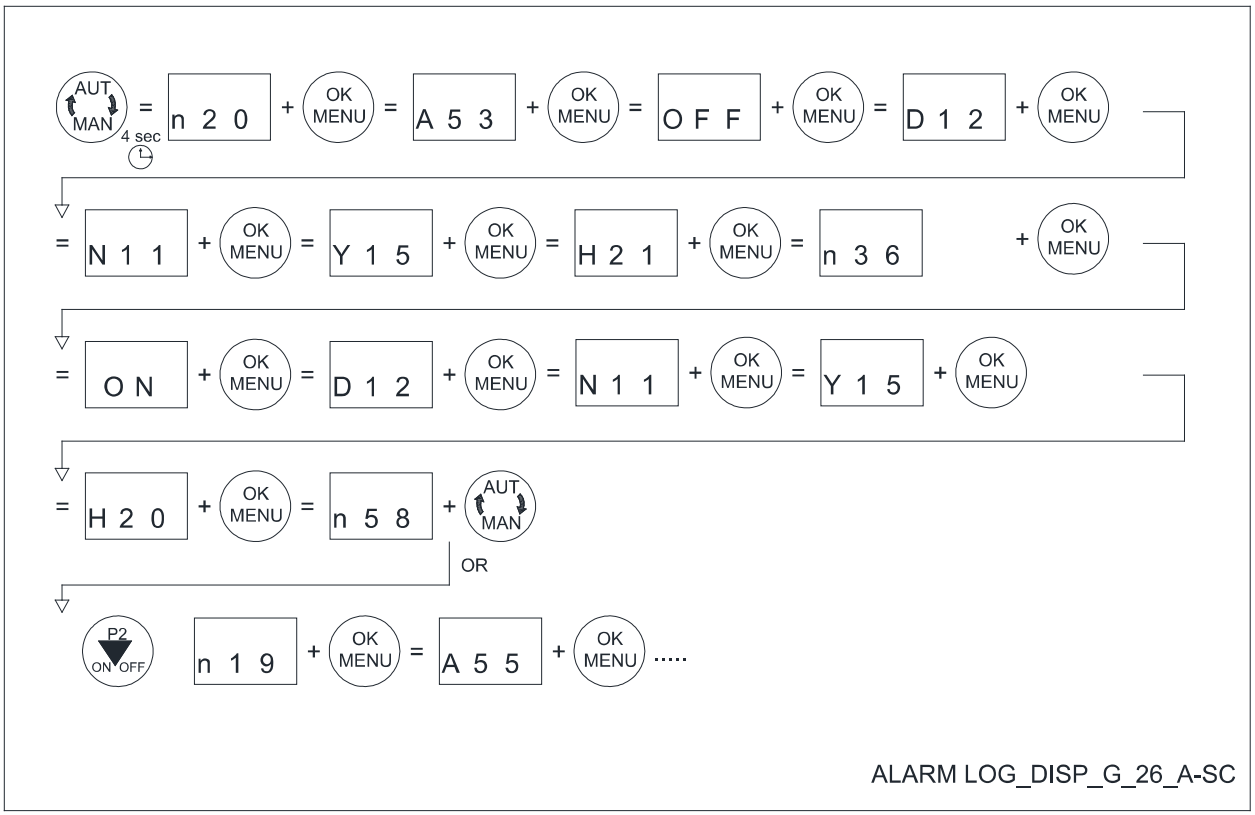
INST-QSMART2APPL1L_G_20_B-SC

64



Q-SMART
SE2
c01 = 2
c02 = 1
c03 = 2
c04 = 1
c06 = 10
r10 = >
t10 = 0
r11 =>
t11 = 0
r12 =>
t12 = 0
r13 =>
t13 = 0
c14 = 1
r34,r35=2(NO)
r36 = 2 (NO)
t36 = 0 sec
r37 = 2 (NO)
t37 = 0 sec
C53 = 1
c54, r54 = 0
t54 = 20
c55,r55,t55=0

INST-QSMART2APPL2L_G_20_B-SC



ALARM LOG_DISP_G_26_A-SC

Xylem Service Italia S.r.l.
Via Vittorio Lombardi 14
36075 – Montecchio Maggiore (VI) - Italy
www.xyleminc.com/brands/lowara

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