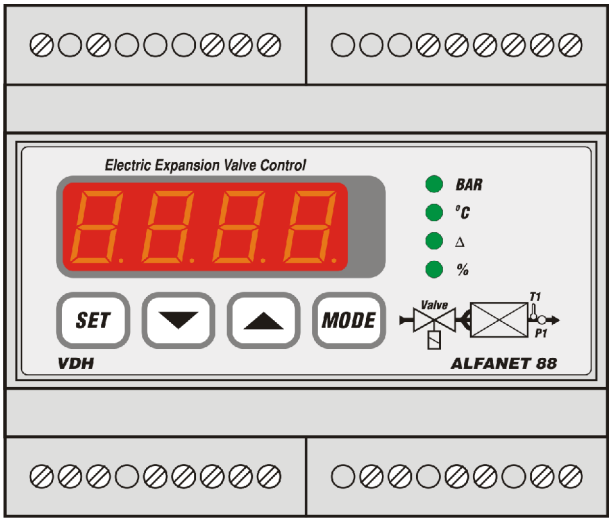
User manual ALFANET 88 PID 15Vac/dc

Electrical expansion-valve controller



VDH doc. 080644 **Version: v1.3** **Date: 16-10-2009**
Software: 071175_ALFANET88-PID File: Do080644.wpd Range -40/+50˚C, 4-20mA

* Function.

The **ALFANET 88** is a controller for controlling electrical expansion valves. Controlling is based on the measured suction pressure and the temperature. The **ALFANET 88** is provided with pressure tables for seven different coolants. It is possible to use a pulse/pause output or a 0/10Vdc P(I) output. The **ALFANET 88** is equipped with both outputs. Because of this it is possible to use several brands and types of expansion valves. The input for the pressure sensor is a 4-20mA input which can be programmed for each required range. Because of this several types of pressure sensors can be used. It is possible to adjust an alarm for guarding a too little temperature difference. This protects the compressor for damage caused by liquid in the compressor. The display can show the measured pressure, the calculated temperature, the measured temperature, the temperature difference or the output percentage. Through the mode key it is possible to switch between these read-outs.
Through the RS 485 network connection it is possible to connect the **ALFANET 88** to the Alfanet for read-out , controlling and data logging.

* Installation.

On the side panel from the **ALFANET 88** and on the connection diagram is shown how to connect the sensors, power supply and the outputs.
After connecting the **ALFANET 88** to the power supply a self-test will take place after which the measured suction pressure will be shown on the display. Before controlling con take place the parameters should be adjusted. Especially parameters **P1, P2, en P3** should be adjusted carefully.

* Operation.

The **ALFANET 88** electrical expansion valves controller can be operated by the means of four push buttons on the front. These push buttons are:

SET - view / change the setpoint.
UP - raise the set point.
DOWN - lower the set point.
MODE - selecting the read-out.

* Viewing and changing the set point.

By pressing the **SET** key the set point becomes visible. A few seconds afters the **SET** key has been released, the set point will disappear and the measured value will again become visible. The set point is the minimal allowed difference between the calculated suction temperature and the measured suction temperature. To change the set point press the **SET** key so that the set point appears on the screen. Release the **SET** key. By now pressing the **SET** key and at the same time the **UP** or **DOWN** keys, the set point can be adjusted.
If the second set point is active (P60=1) and the extra input is closed the second set point is shown. This active set point can also be changed by pressing the **SET** key together with the **UP** or **DOWN** key or by changing parameter P61.
A few seconds after the keys have been released, the measured value will again appear in the display.

* Adjusting the sensors.

The control sensor can be adjusted with the Offset control sensor (parameter 05). Should a sensor indicates 2˚C too much, for example. Then the according Sensor Offset must be lowered by 2˚C.
The pressure sensor can be adjusted with the Offset pressure sensor (parameter 06).

* Resetting the alarm.

During the alarm, the alarm relay and the internal buzzer will be activated. By pushing the **SET** key the buzzer will switched off and the alarm relays will be deactivated. (Depends of the internal adjustments) The error code will be flashing on the display until the fault is solved.

* Error codes.

On the display from the **ALFANET 88** can appear the following error codes:

E 1* - Temperature sensor fault.
E 2* - Pressure sensor fault.
E 4 - No refrigerant selected
E 5 - Delta temperature beneath the alarm value
EE 1 - Adjustments are lost.

Solving E 1/E 2: - Check if the sensor is connected well.
- Check the temperature sensor (1000Ω/25˚C).
- Replace the sensor.

Solving EE 1/ EE 2: - Program the adjustments.

*) **-L-** - In case of a short circuit sensor the display will flashing between the error code **E..** and **-L-** .
-H- - In case of interrupt sensor the display will flashing between the error code **E..** en **-H-**.

* Technical details.

Type	: ALFANET 88 PID Electric Expansion Valve Control
Range	: -40/+50˚C read out per 0,1˚C
Supply	: 15 Vac(dc) 50/60Hz (+5/-10%)
Used Power	: 3,5VA
Display	: 4-digits display
Control	: Through four push buttons on the front
Front	: Polycarbonate
Sensors	: T1 SM 811/2m (PTC 1000Ω/25˚C)
	: P1 Pressure sensor 4..20mA (Ri = 50 Ohm)
Digital inputs	: S1 Contact (potential free)
	S2 Extra input (potential free)
Analogue output	: U1 0-10Vdc valve control signal (Rload min. 10KOhm)
Relays output	: Ry1 Pulse/pause SPST 250V/8A (cos phi=1)
	Ry2 Cooling request SPST 250V/8A (cos phi=1)
	Ry4 Alarm SPST 250V/8A (cos phi=1)
Communication	: RS 485 Network 2x twisted-pair shielded min. 0,5mm^2 (Line-A, -B, 2xGND)
Dimensions	: 106x90x58mm (wxhxd)
Accuracy	: ± 0,5% of range

- Provided with memory protection during power failure.
- DIN-rail mounting
- Equipped with self test function and sensor failure detection.
- Special versions are available upon request.

* Setting internal parameters.

In addition to adjusting the set point a number of internal adjustments can be made, including the sensor-offsets, set point range and alarms settings.
By pressing the **DOWN** key for more than 10 seconds it is possible to enter the 'internal programming menu'. In the left-hand display the upper and lower segment will blink.
Using the **UP** and **DOWN** keys the required parameter can now be selected (see the parameter table).
When the required parameter has been selected, the value of the parameter can be read out by pressing the **SET** key. The parameter value can now be changed by pressing the **UP** and **DOWN** keys.
If, after 30 seconds, no key has been pressed, the **ALFANET 88** will return to the normal operation mode and the changes will be stored.

* Parameters ALFANET 88 PID.

Para-meter	Description	Range	Default Value
P 01	Value pressure sensor at 4mA	-1,0 .. 50,0 Bar	0.0
P 02	Value pressure sensor at 20mA	-1,0 .. 50,0 Bar	10.0
P 03	Refrigerants 0 = Non 1 = R22 2 = R134A 3 = R404A 4 = R407A 5 = R407C 6 = R717 (Ammonia) 7 = R507	0..7	0
P 04	Network number from the pressure sensor (0 = own)	0..250	0
P 05	Offset temperature sensor	-10.0..10.0 K	0.0
P 06	Offset pressure sensor	-1.00..1.00 Bar	0.00
P 10	Set point	0.0 .. 20.0 K	10.0
P 11	P-Band	1.0 .. 50.0 K	10.0
P 12	I-Time	0 .. 9999 Seconds	0
P 13	D-Action	0.0 .. 10.0 %	0
P 15	Pulse/Pause cycle time	5 .. 99 Seconds	6
P 16	Start up duration, If P16>0 than P32 is not longer valid	0 .. 600 Seconds	0
P 17	Fade in till .. %	0 .. 100 %	0
P 20	Function digital input 0 = None 1 = Start cooling request 2 = Block	0 .. 2	0
P 21	Network number master (0 = none)	0 .. 250	0
P 22	Delta T with desired set point (netw) (0.0 = not active)	0.0 .. 20.0 K	0
P 23	P-Band required output (netw) (0.0 = non active)	0.0 .. 20.0 K	0
P 30	Minimal percentage open	0..100%	10
P 31	Minimal percentage close	0..100%	0
P 32	Start percentage at start cooling request	0..100%	0
P 40	Alarm temperature difference	0.0 .. 20.0 K	2.5
P 41	Temperature alarm auto reset	0 = No, 1 = Yes	0
P 42	Auto reset E2 after x minutes correct measure signal (0 = no auto reset)	0 .. 99 Minutes	0
P 43	Delay time before E5 error will pass through to the interface	0 .. 120 Minutes	0
P 50	Minimum set point	0.0..20.0 K	0.0
P 51	Maximum set point	0.0..20.0 K	20.0
P 60	Maximum output if superheat < P 62	0..100%	75
P 61	Maximum output if superheat > P 62	0..100%	100
P 62	Limit between P 60 and P 62	0..20.0K	10.0
P 70	Stepper motor correction	0 = No, 1 = Yes	0
P 71	Minimal opening during cool request	0..30%	10
P 90	Network number	1..250	1
P 91	Fast logging active	0 = No, 1 = Yes	0
P 95	Software version	-	-
P 96	Production date	-	-
P 97	Serial number	-	-

Explanation P01 & P02:

With these 2 parameters the range of the pressure sensor can be adjusted. It is possible to use sensors with different pressure ranges.

Explanation P03:

It is important to select the right refrigerant because of the calculation from the pressure - temperature conversion.

Explanation P04:

With this parameter it is possible to tell the controller if there is a pressure sensor connected or if the controller has to look to another controller with a pressure sensor. If the controller don't have a pressure sensor, the network number from the controller with the pressure sensor should be entered here.

Explanation P05 & P06:

See the chapter "Adjusting the sensors".

Explanation P10:

The required superheat.

Explanation P11:

Proportional band. The difference between the minimum and maximum output.

Explanation P12:

Integration value. The time after which the output has doubled. P.e. the output is 10% and the I-time is 5 minutes. If everything stays equal than the output will been faded till 20% after 5 minutes.

Explanation P13:

Differential action. If the distortion 1% changes than the output changes P13 % from this 1% distortion.

Explanation P15:

The total time from the pulse and the pause. If the measured value comes closer to the set point than the pulse will be shorter and the pause will be longer. The total time from the pulse and the pause stays always the same.

Explanation P16:

After the start up signal the valve increase opening during this time till the percentage from P15. So if P14 is 25s and P15 is 50% than the valve will open 2% per second till the valve is opened for 50%. After this the normal controlling continues. (At Pulse-Pause: every 6 seconds 12%). This will avoid that if a room switches on, the valve opens immediately till 100% and the balance between the other alfanet-88's and the stepcontrol will be destroyed.

Explanation P17:

See P16

Explanation P20:

The function from the digital input can be used for several functions. The input can be switched off, it can be used to start up the controlling or it can be used to block the controlling.

Explanation P21:

Instead of using the digital input it is also possible that a controller gives it's start up signal through the network. This is only possible with certain controllers!

Explanation P22:

A controller who has cooling requirement will announce his set point through the network. The **ALFANET 88** will try to equals the evaporator temperature to set point - P22 as long as this will not result to a suction temperature which is lower than its own adjusted set point (P10).

Explanation P23:

A controller which has a cooling requirement can announce his deviation to his set point through the network (0..100%). The **ALFANET 88** will try to make the evaporator temperature lower if the controller has a lager deviation till his set point. Evaporator temperature = suction pressure + set point superheat + (100 - % deviation controller)/ 100% * P23.

Explanation P30:

Opening will only take place if the output shout be minimal the value of this parameter. This will avoid that the valve opens to short.

Explanation P31:

If the % output is higher than the value of this parameter, the valve will not close.

Explanation P32:

If this value is entered and P14 is 0 (zero), than the valve will open at the first pulse with this percentage. At the next pulses the normal capacity will be used. The reason for this is that there will be enough coolant in the system if the compressor starts without the risk that the pressure will drop till the pump down value. It is also possible to avoid an E2 alarm with this.

Explanation P40:

If the difference between the calculated temperature and the measured temperature is getting to low, an E5 alarm will occure.

Explanation P41:

It is possible to reset the alarm automatic or manual as soon as the delta temperature gets above the alarm value.

Explanation P42:

If there is a error from the pressure sensor only now or than, it is possible to reset this alarm automatic if the measurement has a right value for a certain time.

Explanation P43:

If there is an E5 error, it can be delayed passed through to the interface. This to avoid the alarm relay from the interface will be react to quick. The error code on the display will appear as soon as the E5 error occurs and can not be delayed.

Explanation P50 & P51:

With this parameters it is possible to enter limits to the set point which can be entered with the SET key. This is to avoid that somebody enters a to high or low value.

Explanation P60, P61 & P62:

The maximum output can be limited. It is possible to use two different limits. One if the superheat is lower than P 62 and one if the superheat is larger than P62.

Explanation P70:

Stepper motor valves are not always linear valves. With this parameter a correction can be made to eliminate this deviation.

Explanation P71:

This parameter can be used to open the valve for a minimum percentage if there is a cooling request.

Explanation P90:

This is the network number for the Alfanet. Each controller on the network should have an unique number. If there are equal numbers on the network, it is possible that there occurs unwanted effects. The recommendation is to give the Alfanet 88 controllers the lower numbers and the other controllers on the network the higher network numbers. The reason for this is that the Alfanet 88 uses the Alfanet for mutual communication and the controllers with the lower numbers have a higher priority.

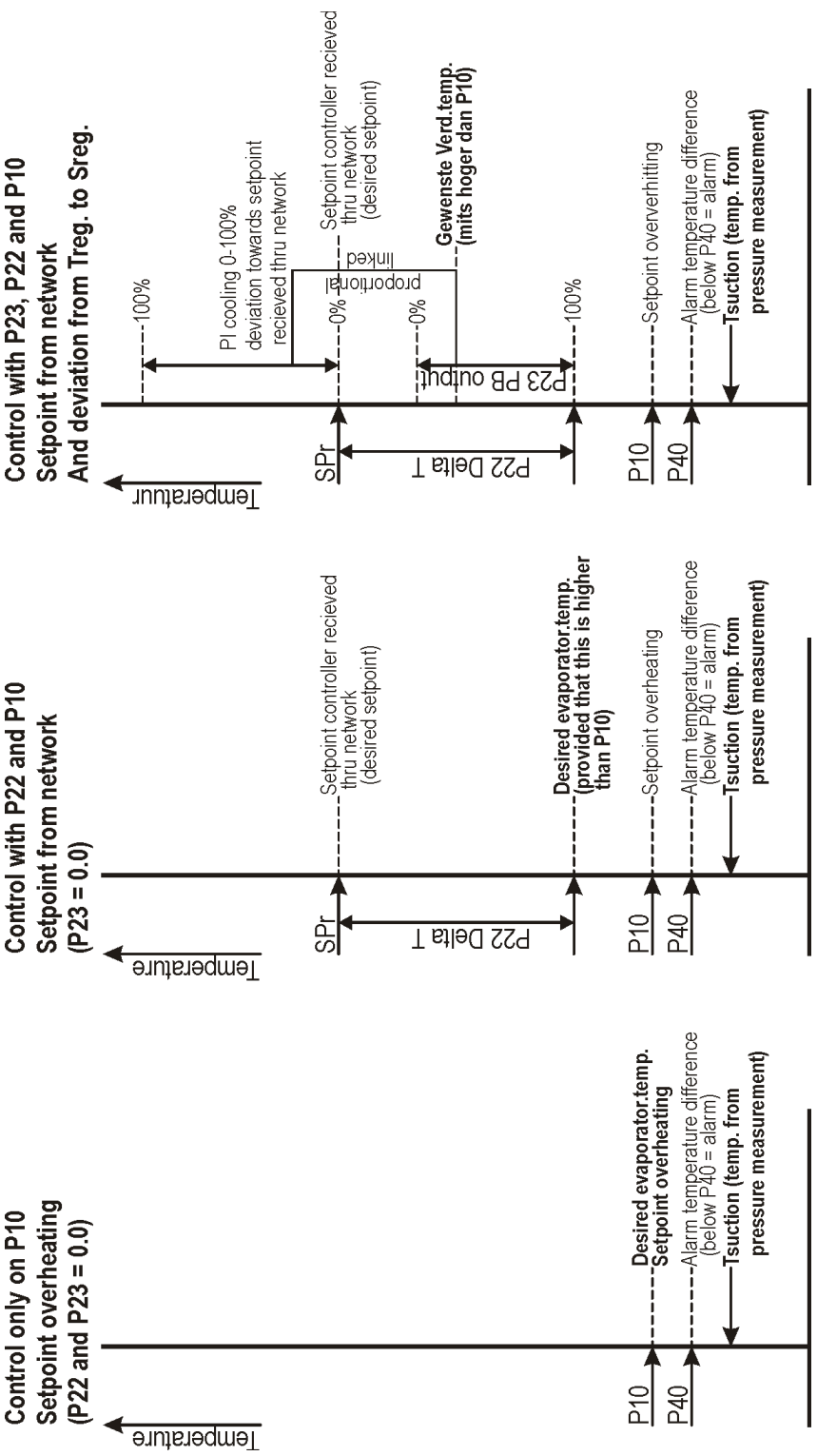
Explanation P91:

With this parameter the interval time for the logging can be set to 5 seconds. This will only work as long as the computer is on and the Alfanet program is running. Disadvantages of this setting is that the files on the computer will be much larger than normal. We recommend to use this fast logging only for analysing and not for normal use.

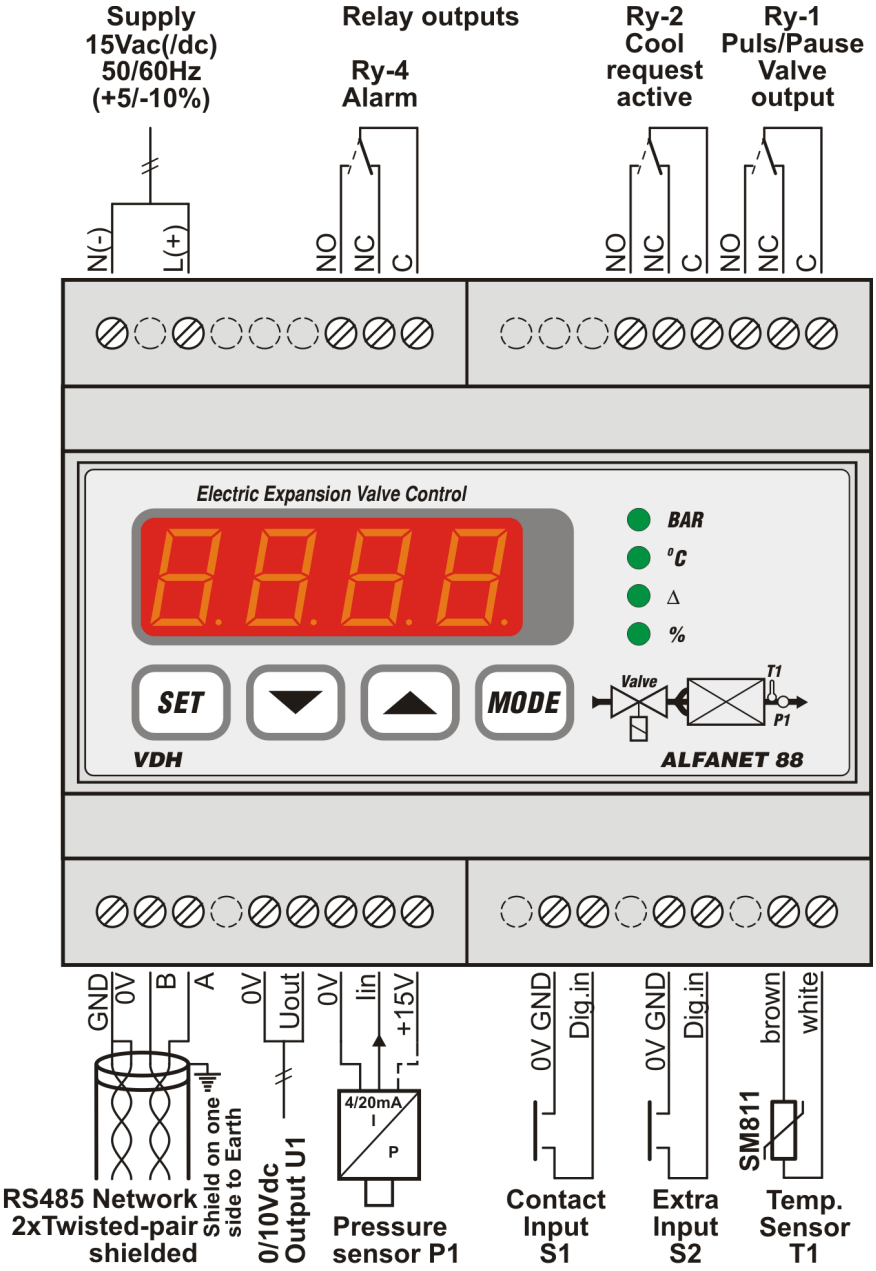
Explanation P95, 96 and 97:

This Parameter is for readout the software version and the production data.

*** Function Diagram**

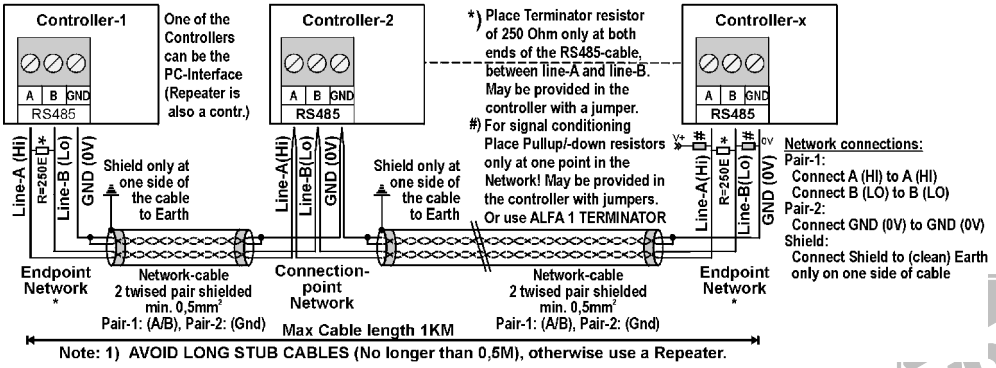


* Connection diagram.

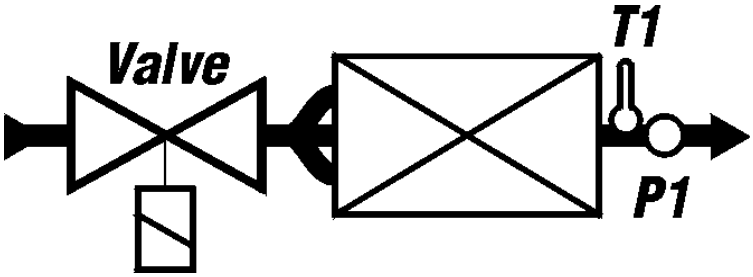


Remark: At 15Vdc supply the (-) may not be connected to 0V. Because in the supply circuit a bridge of diodes is applyed.

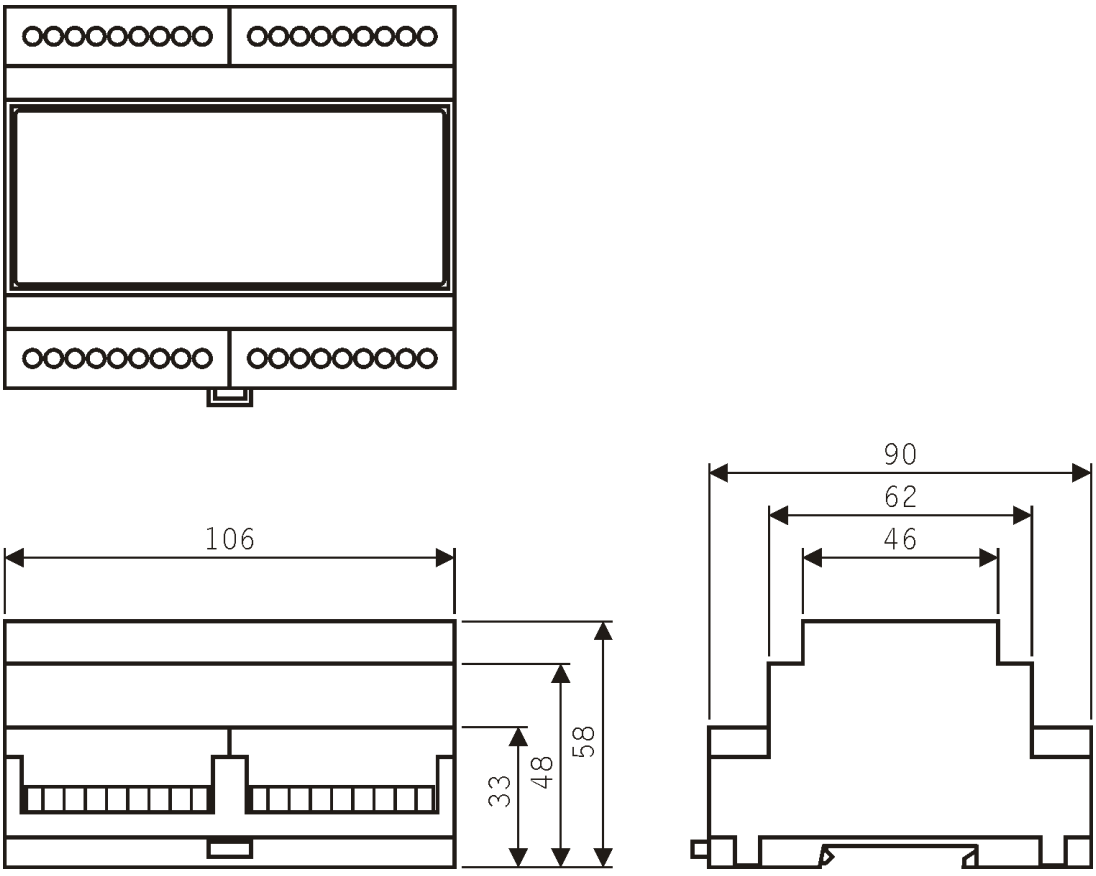
RS 485 NETWORK CONNECTIONS 2-twisted pair shielded cable:



* Schematic diagram.



* Dimensions.



* Adress.

VDH Products BV
Produktieweg 1
9301 ZS Roden
The Netherlands

Tel: +31 (0)50 - 30 28 900
Fax: +31 (0)50 - 30 28 980
Email: info@vdhproducts.nl
Internet: www.vdhproducts.nl