Brief Description / Applications

The HMR controller was designed for transcritical refrigeration plants (e.g. Gas Cooler control CO_2). It can be used for High Pressure Control as well as for Receiver Medium Pressure Control.

- Designed for Gas Cooler Control (e.g. CO_2) in transcritical operation.
- The mode of operation can be set to High Pressure Control or Receiver Medium Pressure Control by setting just one parameter.
- The High Pressure Controller communicates with the Receiver Medium Pressure Controller by a dedicated interface to allow optimum modulation of the High Pressure Control.
- The High Pressure Controller is designed for motorized high pressure throttle valves, up to 120 bar.
- Receiver Medium Pressure Controller operates the gas bypass valve.
- Provides control based on COP characteristic.
- Equipped with intelligent support for heat recovery systems.
- Includes sophisticated protection functions to prevent loss of refrigerant.
- Provides probe-, pressure transducer- and digital inputs, relay outputs and analogue output as 0..10V or 4...20mA signal.
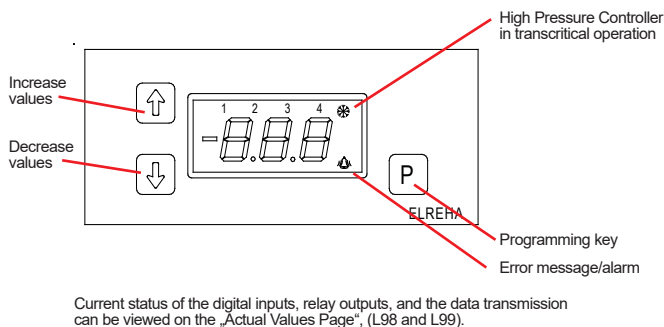

Operating / Operating Elements

Increase values

Decrease values

High Pressure Controller in transcritical operation

Programming key

Error message/alarm

Current status of the digital inputs, relay outputs, and the data transmission can be viewed on the „Actual Values Page", (L98 and L99).

Programming of the entire unit can be achieved with only 3 keys, with all parameters displayed on a red 7-segment LED display.

Programming

All the parameters of the **HMR** are organized in several parameter tables. The unit will display the following under normal operating conditions, when no key was pressed for at least 3 minutes:

1st priority.............Current failure (blinking display).
2nd priority............User selected ‚permanent parameter to be displayed'.

Selecting and Changing Parameters

Key	Action
P (> 2 sec.)	Page name will be displayed
⇧ ⇩	Select desired page
P	Enter the page
⇧ ⇩	Select parameter
P	Prepare programming. Enter access code if necessary
⇧ ⇩	Change value. If you hold the key, the values change faster and faster
P	Confirm programming
P (> 2 sec.)	Page name will be displayed again

Access Protection

Most parameters are protected and require a code to get access in order to change values. Perform the following steps to gain access to those parameters when needed:

C00

1. Press the „P" key to display the ‚code entry' prompt.

88

2. Adjust the code to 88, using the „UP"/"DOWN" arrow keys.
3. Press the „P" key again to confirm.

If no key is pressed for at least 3 minutes, the code is reset and must be entered again to get access.

Basic configuration of the controller for High Pressure or Receiver Medium Pressure

See page 3

Parameter Pages

P > 2 sec.   1st. Parameter on the-:

[L] ⇒ P ⇒ L01   Actual Values Page

⇧ [r] ⇒ P ⇒ r16   Setpoint Page

⇩ [P] ⇒ P ⇒ P01   Mode Page

[h] ⇒ P ⇒ h01   Assignment Page

⚠ **Please note safety instructions !**
Attention

Technical Data

Supply Voltage.............................230V, 50-60Hz, max. 9VA (controller only)
Ambient Temperature...0...+50°C
Max. Ambient Humidity ....85% r.F., not condensing
Analogue Inputs................................4x temperature sensors TF 201 (PTC)
         or TF 501 (Pt 1000), as well as customer specific probes
         1x pressure transducer 0(2)-10V (scalable), Ri=69 kOhm
Measuring ranges..................TF 501 (Pt1000)....................-100°C...+160°C
of the probe/temp. inputs   TF 201 (PTC, 2 kΩ at°C)...........-50°C...+100°C
         So1 .... -40°C...+25°C
         So2 .... -50°C...+50°C

⚠ **Note**   **Pay attention on the temperature ranges of probe heads and cables!**

Accuracy ....±0.5K in range -35...25°C within
         the ambient temperature range 10...30°C
Digital Inputs ....4x mains voltage, 3mA max.
         overvoltage category II, pollution degree 2
Relay Outputs ....1x SPDT, 3x SPST, isolated, 8A res/3A ind./250V
         overvoltage category III, pollution degree 2
SSR-Output (e.g. for EEx-Valve) .... 1x Solid-State-Relay (SSR),
         max. 0,5 A / 230VAC
         overvoltage category III, pollution degree 2

⚠ **Note**   **Please note the information in the connection plan about a necessary snubber circuit at the SSR output!**

Transducer Supply ....22V DC ±10%, 40 mA max.
Analogue Output.......................4...20 mA, max. shunt resistance 250 ohms
Display/Parameter Ranges .... see parameter pages
Data Interfaces ....3x RS 485
Data storage ....unlimited
Real Time Clock ....automatic DST switch
         10 days clock backup without mains voltage
Housing................plastic with foil keypad for rail mounting (DIN EN 50022),
         screw terminals 2,5 mm

Accessories

- Temperature probe TF 501, quantity depends on application
- Pressure transducer with 4-20 mA output
- PC-Software "**CV-Scheduler**"
- Module "**COOLVision-MES**" for remote control and configuration via VPR or SMZ systems.

CONNECTION INFORMATION & SAFETY INSTRUCTIONS

ℹ **Notice**   Product warranty does not cover damage caused by failure to comply with these operating instructions! Nor will ELREHA be held liable for any personal injury or damage to property caused by improper handling or failure to observe the safety instructions and recommendations contained in this or any other ELREHA supplied document related to this product! This manual contains additional safety instructions throughout the functional description. Please pay close attention to these instructions!

⚠ **Danger**   **TO AVOID RISK TO HEALTH OR POSSIBLE LOSS OF LIFE, DO NOT OPERATE IF:**

- The device has visible damage or doesn't work
- After a long storage period under unfavourable conditions
- The device is heavily soiled or wet
- When shipped under inadequate conditions

- Never use this product in equipment or systems that are intended to be used in applications or under circumstances that may affect human life. For applications requiring extremely high reliability, please contact the manufacturer before use.

- **This product may only be used in the applications described on page 1.**

- **Electrical installation and placement into service must be performed by qualified personnel only.**

- **To avoid the risk of Electrical Shock, all 'PE' terminals must be connected to ground. Without adequately grounding the unit, the internal noise filter will not work, which can cause faulty readings, or inaccurate displayed values to occur.**

- **Never operate the device without the supplied enclosure.**

- **To prevent electrical shock, the device may only be operated in a closed control cabinet or control box.**

- **Be sure to observe all local, state, or federal safety regulations in the location that the unit is installed.**

⚠ **Caution**
- Before installation, verify that the control specifications suit the application details. Damage may occur if the unit is operated outside of its specified limitations.
  Examples:
  - Supply voltage (printed on the type label).
  - Environmental limits for temperature/humidity.
  - Maximum current rating for the relays.

- Do not install sensor cables in parallel to high current cables. Shielding must be connected to PE at the end close to the controller. If not, inductive interferences may occur. The wire gauge should be no less than 0,5mm².

- Mounting the controller close to power relays is not recommended, due to the risk of strong electro-magnetic interference, which can cause the unit to malfunction!

- Ensure that the interface wiring meets all the necessary requirements.

- All used temperature sensors must be identical. Never use different types at the same time. This will not work.

ℹ **Notice**   **Cleaning**
The use of a dry, lint-free cloth is sufficient to clean the product. Never use liquids or acidic fluids! Risk of damage!

Basic Configuration High Pressure / Receiver Medium Pressure

- As the controller is switched on, press and hold the „X" key while „**cFI**' is displayed, then release.
- Press the 'P' key when the display reads 'oFF'.
- When the 'C00' appears on the display, use the 'UP'/'Down' arrow keys to adjust the code to 88.
- Adjust the setting as needed. (0=Receiver Medium Pressure, 1=High Pressure).
- Once a selection is made, press the 'P' key to confirm the selection.
- All 'Setpoint Page' and 'Assignment Page' parameters will be reset to default settings simultaneously.

'Default Display Parameter' - Function

Once the controller is powered up, the display will show the selected 'default display parameter', unless there is a current failure, which will be displayed instead.
*Note: The actual value of the pressure transmitter, (**L15**), is the factory preset.

To change the 'Default Display Parameter'

1. Select the parameter you want to be the 'Default Display Parameter'.
2. Press the "⇧" and "⇩" keys simultaneously. The display will then show '*888*' momentarily before the new 'Default Display Parameter' is displayed.

Error Messages / Error Memory / Error Codes

In the event of a failure, the controller will automatically display parameter 'L20' with a flashing abbreviation of the specific error, see error list below. If there is more than one error, the „UP"/"DOWN" keys can be used to scroll through the error list. The unit stores the last **15** error messages with date and time of occurrence. All the information is also available via data interface.

---- ....no error
hrd ......hardware failure
Pco ......Error parallel compression
HFL ......High pressure lower alarm
HFH ....High pressure upper alarm
5FL ......Receiver pressure lower alarm
5FH ......Receiver pressure upper alarm
t1b ......sensor 1 broken
t2b ......sensor 2 broken
t3b ......sensor 3 broken
t4b ......sensor 4 broken
t5b ......sensor 5 broken
t6b ......sensor 6 broken
t1c ......sensor 1 short-circuited
t2c ......sensor 2 short-circuited
t3c ......sensor 3 short-circuited
t4c ......sensor 4 short-circuited
t5c ......sensor 5 short-circuited
t6c ......sensor 6 short-circuited

5EL ......error in assignment page, e.g. function selected too often

If a sensor is electrically shorted or broken, the alarm will be activated after a 5 second time delay.

A compound malfunction, reported by the VPR 5240-2, causes the blocking of the flashgas bypass valve.

Parameter Pages

Actual Values Page [L]

Param.	Disp	Note	Range	Factory Setting
L01	X	Actual temperature value of sensor 1	-100,0...+160,0 °C	---
up to		(can be corrected ±10K, function see Assignment Page)		
L04	X	Actual temperature value of sensor 4	-100,0...+160,0 °C	---
L15	X	Actual value of pressure transmitter, input 5	-1,0...160,0 bar	---
L16	X	Actual value of HR offset, input 6	-1,0...100,0 bar	---
L20	X	Actual error		---
L21	X	Actual value of gas cooler outlet HP averaged		---
L22	X	Actual value GCB outlet HP averaged		---
L23	X	Actual value of water outlet / shifting sensor GCB averaged		---
L30	X	Analogue output value to control the RMP valve, unlimited	0,0...100,0 %.	---
L31	X	Analogue output value to control the RMP valve, current value	0,0...100,0 %.	---
L32	X	If 0 V at DI → forced closure of the RMP valve (for 100 % compound failure)	0, 1	
L40	X	Analogue output value to control the HP valve, unlimited	0,0...100,0 %	---
L41	X	Analogue output value to control the HP valve, current value	0,0...100,0 %	---
L42	X	HP valve, 100% utilization forced by digital input signal	0, 1	---
L43	X	HP valve, 0% utilization forced by digital input signal	0, 1	---
L44	X	HR activated by digital input signal	0, 1	---
L45	X	Receiver medium pressure actual value, from RMP control via master/slave (- - - =no val.)	-1,0...160,0 bar	---
L46	X	Receiver medium pressure min. limit value, from RMP control via master/slave	0,0...90,0 bar	---
L47	X	Receiver medium pressure setpoint, from RMP control via master/slave	0,0...90,0 bar	---
L48	X	Receiver medium pressure max. limit value, from RMP control via master/slave	0,0...90,0 bar	---
L49	X	Operation mode	0 = subcritical / 1 = transcritical	---
L50	X	Status gas cooler bypass (GCB)	0 = GCB off / 1 = GCB on	---
L60	X	Parallel compression - Release status (0: locked, 1: released)	0, 1	---
L61	X	Parallel compression - Status of external lock (1=active)	0, 1	---
L62	X	Status of RMP valve (0: locked, 1: released)	0, 1	---
L63	X	Parallel compression - on-delay remaining time	0...600 sec.	
L64	X	Parallel compression - off-delay remaining time	0...600 sec.	
L65	X	Parallel compression - minimum runtime remaining time	0...600 sec.	
L66	X	Parallel compression - minimum down time remaining time	0...600 sec.	
L67	X	Parallel compression - error delay remaining time	0...999 sec.	
L98	X	Status of the digital inputs DI 1...DI 4		
L99	X	Status of the relays 1-5		

ℹ Parameters marked by "**Disp**" are for information only and cannot be changed.

ℹ Abbreviations used in this manual:
HP = High Pressure
RMP = Receiver medium pressure
HR = Heat recovery
GCB = Gas cooler bypass

Setpoint Page [r]

Param.	Disp	Note	Range	Factory Setting
r16		Alarm delay RMP - upper	0...900 sec	300
r17		Alarm delay RMP - lower	0...900 sec	300
r18		Delay time of redundancy relay RMP - Upper	0...300 sec	30
r19		Delay time of redundancy relay RMP - Lower	0...300 sec	30
r20		Parallel compression - safety threshold high (relative to the setpoint medium pressure)	0,0...20,0 bar	2,0
r21		Parallel compression - switch off value (relative to the setpoint medium pressure)	0,0...-10,0 bar	-2,0
r22		Parallel compression - start value (utilization of the flashgas valve)	10,0...100,0 %	35,0
r23		Parallel compression - start delay time	0...600 sec.	60
r24		Parallel compression - stop delay time	0...600 sec.	10
r25		Parallel compression - minimum run time	0...600 sec.	5
r26		Parallel compression - minimum down time	0...600 sec.	60
r27		Parallel compression - error delay	0...999 sec.	300
r30		Receiver medium pressure - minimum limit value	0,0...90,0 bar	30,0
r31		Receiver medium pressure - setpoint	0,0...90,0 bar	34,0
r32		Receiver medium pressure - maximum limit value	0,0...90,0 bar	38,0
r33		Receiver medium pressure - proportional range	0,1...20,0 bar	2,0
r34		Receiver medium pressure - integral time	1...360 sec	360
r35		Receiver medium pressure - factorization of the integral action	0...100 %	30
r36		Receiver medium pressure - dead time compensation - step size	1,0...100,0 %	15,0
r37		Receiver medium pressure - dead time compensation - interval time	0...60 sec.	1
r38		Receiver medium pressure valve - maximum power limitation	20,0...100,0 %	100,0
r40		High pressure - minimum limit value	0,0...90,0 bar	40,0
r41	X	Calculated high pressure setpoint, inclusive heat recovery offset	0,0...160,0 bar	
r42		High pressure - maximum limit value	0,0...160,0 bar	95,0
r43		High pressure - proportional range	0,1...60,0 bar	5,0
r44		High pressure - integral time	1...999 sec	360
r45		High pressure - factorization of the integral action	0...100 %	30
r46		High pressure - dead time compensation - step size	1,0...100,0 %	5,0
r47		High pressure - dead time compensation - interval time	0...60 sec	1
r48		High pressure valve - maximum power limitation	20,0...100,0 %	100,0
r49		High pressure - setpoint for heat recovery	0,0...100,0 bar	80,0
r50		Offset from minimum limit (r30) and maximum limit (r32): HP modulation will start when the RMP control's actual value touches the resulting threshold values.	0,1...10,0 bar	2,5
r51		HP modulation factor: Influence to the HP setpoint while RMP deviation exceeds the limits defined by r50	0,0...20,0 bar/bar	8,0
r52		Start utilization HP valve, if RMP is below the minimum value r30	0,0...100,0 %	10,0
r53		Latency period: minimum runtime for transcritical operation mode (above 76 bar)	0...60 min	15
r54		Setpoint temperature limit latency range, below	10,0...30,0 °C	22,0
r55		Setpoint temperature limit latency range, above	10,0...30,0 °C	30,0
r56		Offset subcooling	0,0...10,0 K	0,0
r57		Alarm value HP, upper (relative to the calculated high pressure setpoint)	1,0...20,0 bar	2,0
r58		Alarm delay HP, upper	0...900 sec.	300
r59		Alarm delay HP, lower	0...900 sec.	300
r60		Delay redundancy relay HP, upper deviation	0...300 sec.	30
r61		Delay redundancy relay HP, lower deviation	0...300 sec.	30
r62		GCB HP - proportional range	0,1...60,0 bar	5,0
r63		GCB HP - integral time	1...999 sec	360
r64		GCB HP - factorization of the integral action	0...100 %	30
r65		GCB HP dead time compensation - step size	1,0...100,0 %	5,0
r66		GCB HP dead time compensation - interval time	0...60 sec	1
r67		GCB HP - OFF value	70,0...160,0 bar	88,0
r68		GCB ON delay after HP - OFF	0...60 min	5
r69		GCB water temperature OFF value	0,0...100,0 °C	33,0
r70		GCB hysteresis water temperature OFF value (relative value; r69-r70=ON value)	1,0...40,0 K	4,0
r71		HR offset by water outlet - temperature threshold high (absolute value)	0,0...100,0 °C	0,0
r72		HR offset by water outlet - temperature threshold low (absolute value)	0,0...100,0 °C	0,0
r73		HR offset by water outlet - pressure offset high (relative value)	-20,0...20,0 bar	0,0
r74		HR offset by water outlet - pressure offset low (relative value)	-20,0...20,0 bar	0,0
r80		Digital input analogue value	0,0...100,0 %	0,0
r90		Oil valve cycle time 1...60 min	2	
r91		Oil valve ON time	0...900 sec	3

ℹ Parameters marked by **"Disp"** are for information only and cannot be changed.

ℹ Abbreviations used in this manual:
HP = High Pressure
RMP = Receiver medium pressure
HR = Heat recovery
GCB = Gas cooler bypass

Mode Page [P]

Param.	Note	Range	Factory Setting
P01	Assigned to compound # (0 = not assigned)	0, 1, 2, 3	1
P31	Actual value correction of sensor 1	+/-10.0 K adjustable	0.0 K
P32	Actual value correction of sensor 2	+/-10.0 K adjustable	0.0 K
P33	Actual value correction of sensor 3	+/-10.0 K adjustable	0.0 K
P34	Actual value correction of sensor 4	+/-10.0 K adjustable	0.0 K
P35	Actual value correction of input 5	+/-10.0 bar adjustable	0.0 bar
P36	Actual value correction of input 6	+/-10.0 bar adjustable	0.0 bar
P70	Daylight saving time (DST)	oFF = off, EU = on, tun = variable	EU
P71	Time zone offset	-720...720 min.	60 min.
P72	DST ON Month	(only for tun) 1...12	3
P73	DST ON Day	(only for tun) 0 (Sunday)...6	0
P74	DST ON x-Day	(only for tun) 0...5 (last), 0 = off	5
P75	DST ON Hour	(only for tun) 0...23	2
P76	DST OFF Month	(only for tun) 1...12	10
P77	DST OFF Day	(only for tun) 0 (Sunday)...6	0
P78	DST OFF x-Day	(only for tun) 0...5 (last), 0 = off	5
P79	DST OFF Hour	(only for tun) 0...23	3
P80	Year		
P81	Month		
P82	Day		
P83	Hour		
P84	Minute		
P85	Second		
P87	Software version		
P89	Data transmission speed (baudrate)	12(00)...115(00)	96(00)
P90	Address of the controller unit in a network	0 - 78	78

Assignment Page [h]

Param.	Note	Range	Factory Set.
h01	High pressure (HP) or rec. med. press.(RMP)	0 = RMP, 1 = HP	1
h11	Function of relay 1	---, on= continuous on, ALA= alarm, Eon= HP valve on, EoF= HP valve off, PSP= release parallel compression passive, PSA= release parallel compression active, bYP= gas cooler bypass ON, oIL= pulsed output for oil return, rEd= redundancy relay	ALA
h12	Function of relay 2	ditto	---
h13	Function of relay 3	ditto	---
h14	Function of relay 4	ditto	---
h15	Function of relay 5 (solid state relay)	ditto	---
h20	Sensor type	501 (TF501/Pt1000), 201 (TF 201), S01, S02	501
h21	Function of sensor 1	--- = switched off, dIS = display, thd = gas cooler outflow temperature HP, bYP = gas cooler bypass sensor, ShF = HR water outlet shifting probe HP	thd (HP) / --- (SP)
h22	Function of sensor 2	ditto	---
h23	Function of sensor 3	ditto	---
h24	Function of sensor 4	ditto	---
h25	Function of sensor 5 (current)	--- = switched off, con = control input for HP resp. RMP	con
h26	Function of sensor 6 (voltage)	--- = switched off, ShF = setpoint shift heat recovery	---
h31	Function of digital input (DI) 1	--- = switched off, AnA = set analogue output to a fixed value, coP = receiver medium pressure input: flashgas bypass valve OFF, Eon = high pressure input: high pressure valve ON, EoA = high pressure input: high pressure valve OFF, rEc = high pressure input: HR (recovery), PoP = lock parallel compression passive, PoA = lock parallel compression active, coA = receiver medium press. input: flashgas bypass valve OFF active, EoP = high pressure input: high pressure valve OFF passive, bPP = gascooler bypass request passive, bPA = gascooler bypass request active	EoP (HP) / coP (SP)
h32	Function of digital input (DI) 2	ditto	---
h33	Function of digital input (DI) 3	ditto	---
h34	Function of digital input (DI) 4	ditto	---
h40	Analogue output delivers	1 = voltage 0-10V, 0 = current 4-20mA	0
h41	Analogue output works as/delivers	--- = 0V / 4 mA, 100 = 100% (10V resp. 20 mA), con = receiver medium pressure / high pressure output, SEt = adjustable value in r80	con
h93	Pressure transmitter, lower limit, input 5	-1,0...+160,0 bar	-1,0
h94	Pressure transmitter, upper limit, input 5	-1,0...+160,0 bar	+60,0 (SP) / +160,0 (HP)
h95	Voltage lower limit, HR offset, input 6	Parameter display and failure monitoring only, if the digital input function 'high pressure input HR' is selected 0,0...10,0 V	0,0
h96	Voltage high limit, HR offset, input 6	0,0...10,0 V	10,0
h97	HR offset lower limit, input 6	0,0...+100,0 bar	0,0
h98	HR offset upper limit, input 6	0,0...+100,0 bar	0,0

> **i** Abbreviations used in this manual:
> HP = High Pressure
> RMP = Receiver medium pressure
> HR = Heat recovery
> GCB = Gas cooler bypass

Real Time Clock

The built-in real time clock will run for a maximum of 10 days after mains power is lost.
To set Date and Time, use parameters „P80"..."P85" located on the „Mode Page".
Default time zone can be adjusted if needed, the factory preset is GMT+01:00, („Time Zone Offset'=60 min.).

Daylight saving time switch - Time Zones
The unit is factory preset to automatically switch between DST and standard time based on the current EU-96 rules, (**P70** = EU). This can be switched off or changed as needed.

Variable Time Zones
The function for Variable Time Zones can be activated using ‚P70', and adjusted using ‚P72'-'P79'.

P72 *(DST ON Month) ......* (Fact. Setting 3, March)
The month of the beginning of the daylight saving time
P73 *(DST ON Day) ....*(Fact. Setting 0, sunday)
The weekday of the beginning of the daylight saving time.
P74 *(DST ON x-Day) .....*(Fact. Set. 5, last sunday)
The x-th with "*DST ON Day*" preset day of the month

P75 *(DST ON Hour).....* (Fact. Setting 2, 2 o'clock)
The hour of the beginning of the daylight saving time
P76 *(DST OFF Month) ...*(Fact. Setting 10, October)
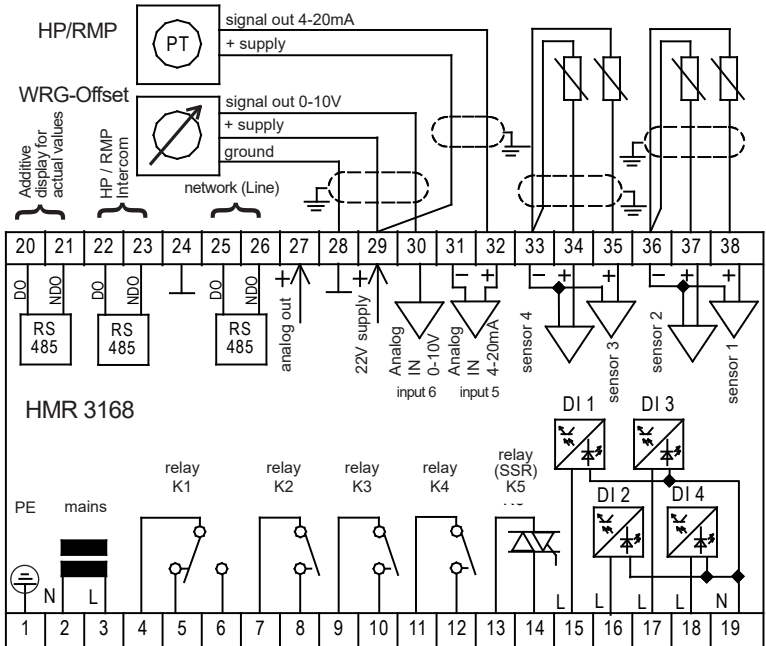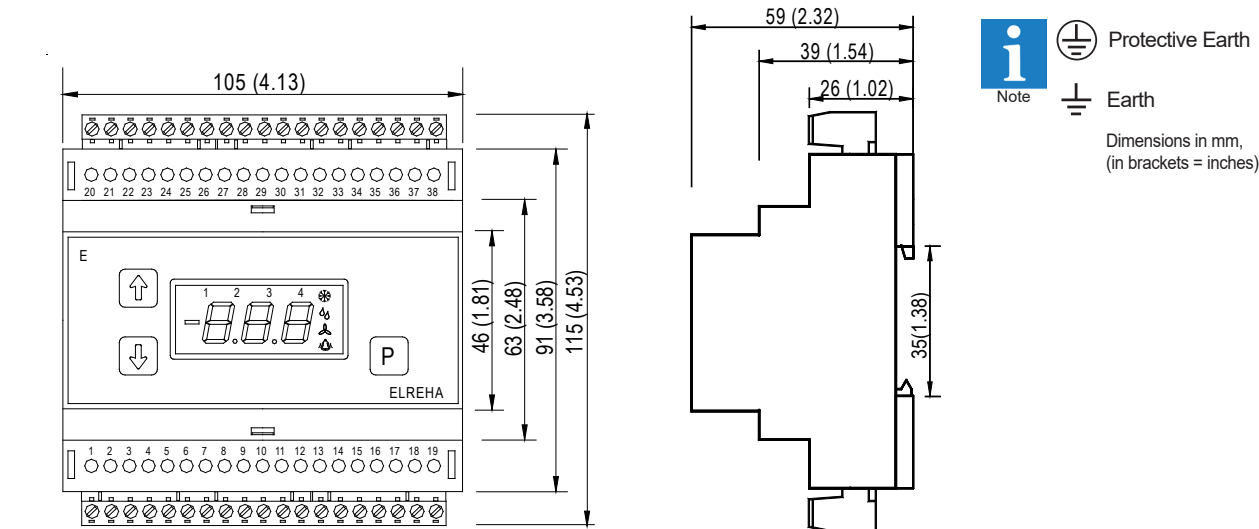The month of the end of the daylight saving time
P77 *(DST OFF Day)........*(Fact. Setting 0, sunday)
The weekday of the end of the daylight saving time
P78 *(DST OFF x-Day) ....* (Fact. Set. 5, last sunday)
The x-th with "*DST OFF Day*" preset day of the month
P79 *(DST OFF Hour) ....* (Fact. Set. 3, 3 o'clock)
The hour of the end of the daylight saving time

The shift to DST resp. standard time is set by the time setting which is active at this time.
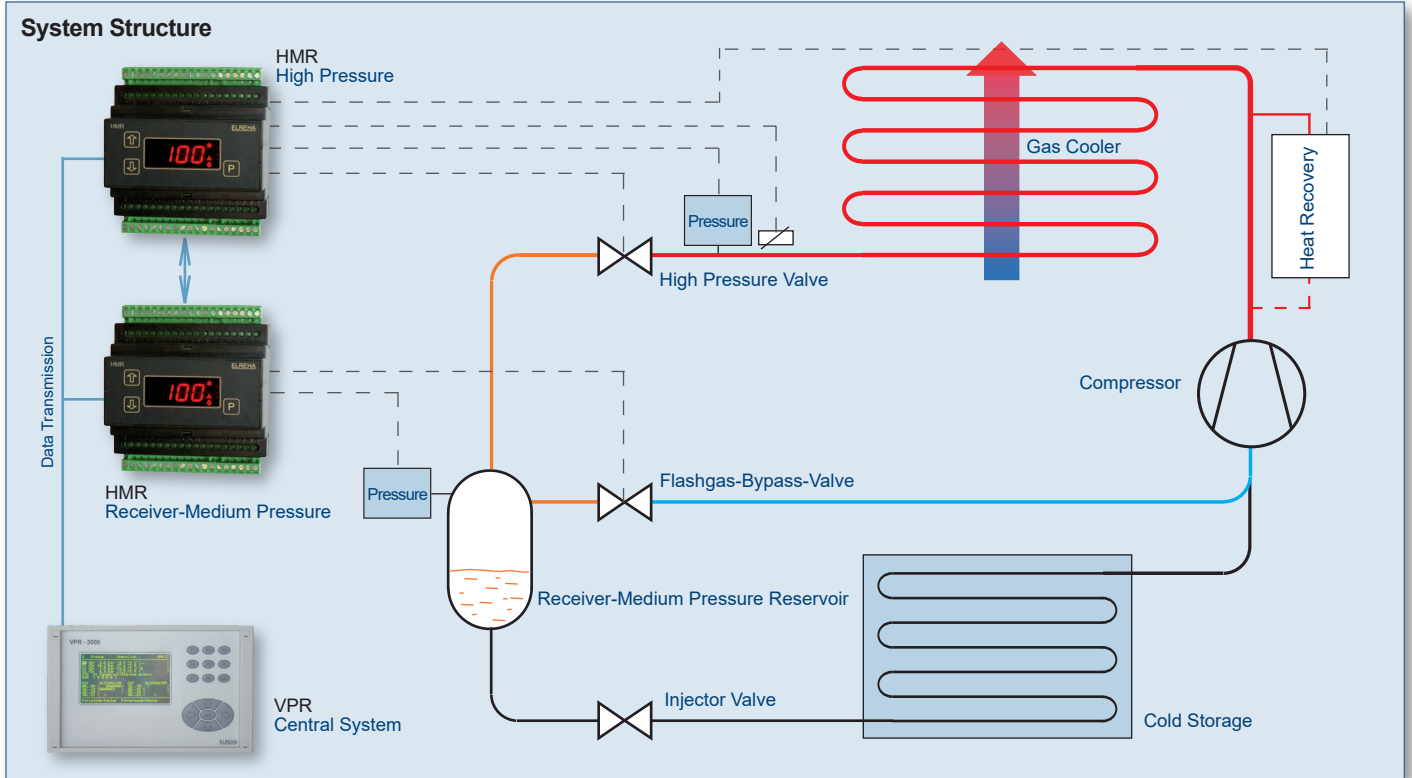
Dimensions & Connection

System Structure

HMR
High Pressure

Data Transmission

HMR
Receiver-Medium Pressure

VPR
Central System

Gas Cooler

Heat Recovery

Pressure

High Pressure Valve

Compressor

Pressure

Flashgas-Bypass-Valve

Receiver-Medium Pressure Reservoir

Injector Valve

Cold Storage

EC Declaration of Conformity   CE

*For the device **HMR 3168** we state the following:*
*When operated in accordance with the technical manual, the criteria have been met that are outlined in the EMC Directive **2014/30/EC** and the Low Voltage Directive **2014/35/EC**. This declaration is valid for those products covered by the technical manual which itself is part of the declaration.*

Following standards were consulted for the conformity testing to meet the requirements of EMC and Low Voltage Guidelines:

EN 55011:2016, EN 61010-1:2010, EN 61326-1:2013   **CE marking of year: 2017**

This statement is made for the manufacturer / importer   *by:*

ELREHA Elektronische Regelungen GmbH   **Werner Roemer,** *Technical Director*
D-68766 Hockenheim

www.elreha.de   **Hockenheim** ......**30.5.2017**......................................

(*Name / Address*)   *City*   *Date*   *Signature*

ℹ This manual, which is part of the product, has been set up with care and our best knowledge, but mistakes are still possible. Technical details can be changed without notice, especially the software. Please note that the described functions are only valid for units containing the software with the version-number shown on page 1 of this manual. Units with an other version number may work a little bit different.