Operating Manual
External commutation electronics 350W
CHW035-AB02-01

preliminary
14.02.2014

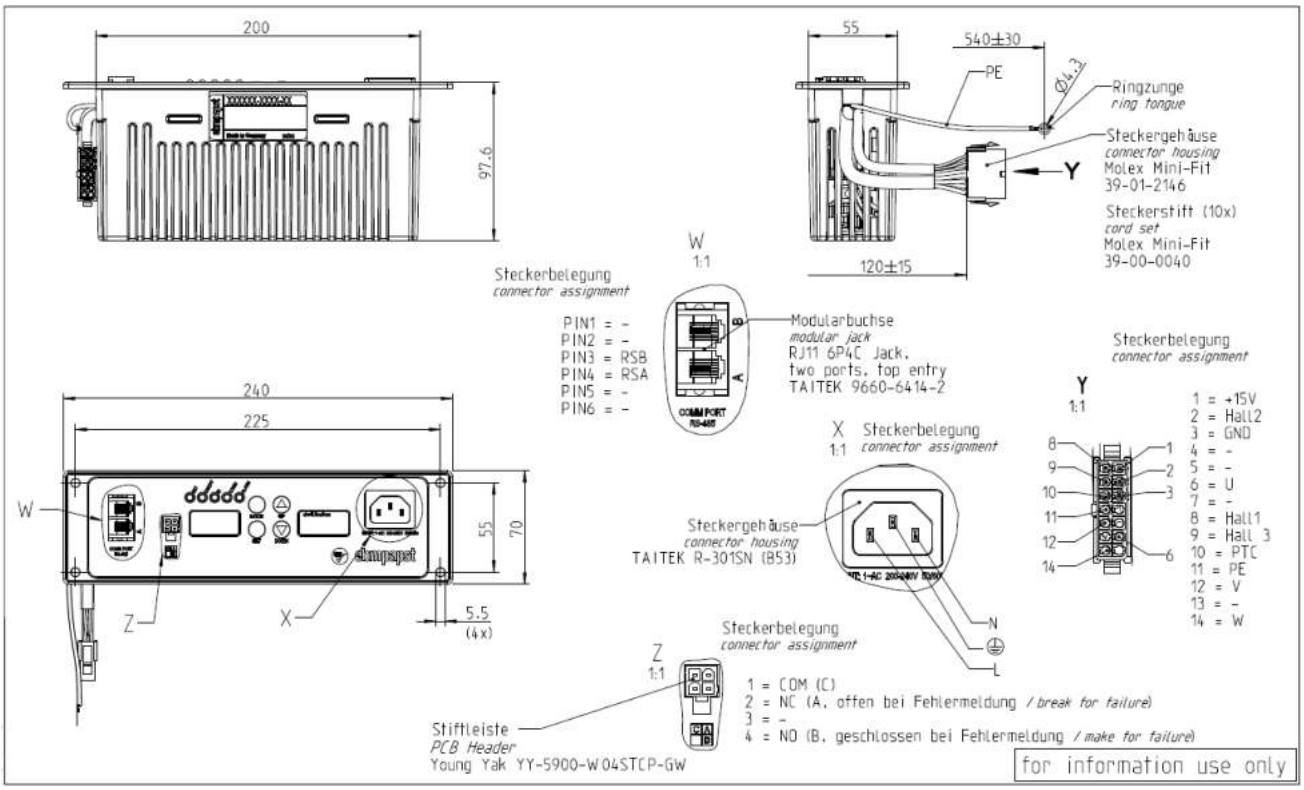


Form 1003

1 Technical data

Rated voltage:	200V AC - 240V AC
Voltage range:	180V AC - 264V AC
Line frequency:	47 .. 63 Hz
max. power input:	Pnom = 350W
max. line current:	I1 = 1,46A (240V), I1 = 1,75A (200V)
Power factor (at Pnom):	> 0,98
DC-link voltage:	435V DC
Motor current RMS:	I mot,RMS,max. = 1,1A RMS
Leakage current:	<3,5mA according to EN 60990
Weight:	approx. 900g
EC-conformity	the device is to be used solely outside of the EU EMC declaration of conformity acc. to the applicable EN-standards cannot be issued

2 Dimensions



3 Setting up the unit

Install the CHW035-AB02-01 unit vertically or horizontally. Use M4 or M5 screws.
Keep a distance of 40mm all around the unit for sufficient cooling.

A 3-core ebm-papst EC fan, designed for 435 V DC link voltage, can be connected to the CHW035-AB02-01 unit.
Only use ebm-papst R3G470-AA05-24 or R3G470-AB05-24 with the CHW035-AB02-01 unit.

CHW035-AB02-01 and EC-fans R3G470-AA05-24 or R3G470-AB05-24 are perfectly matched and must be installed as a set. Fan and electronics must be arranged in a common housing in order to assure appropriate cooling of the electronics through the air-stream of the fan. The cooling gaps in the electronic housing must be directed to the fan's discharge side to provide for rated capacity of the electronic device.



4 Ambient conditions

Protection type of housing:	IP20 acc. to DIN EN 60529 (with fit-in components, the connection zone is exempt)
Ambient temperature:	0°C - +40°C 0°C - +30°C (at rated voltage 200V -10%)
Relative humidity:	<95%, without condensation

- The CHW035-AB02-01 unit has to be set up in clean and dry environment free of dripping water.
- Do not operate this unit in explosive atmosphere.

5 Voltage supply

Voltage from 200 V to 240 VAC / 50-60 Hz for rated capacity
Instrument fuse: glass-tube fuse 4A T (time-lag) is built-in

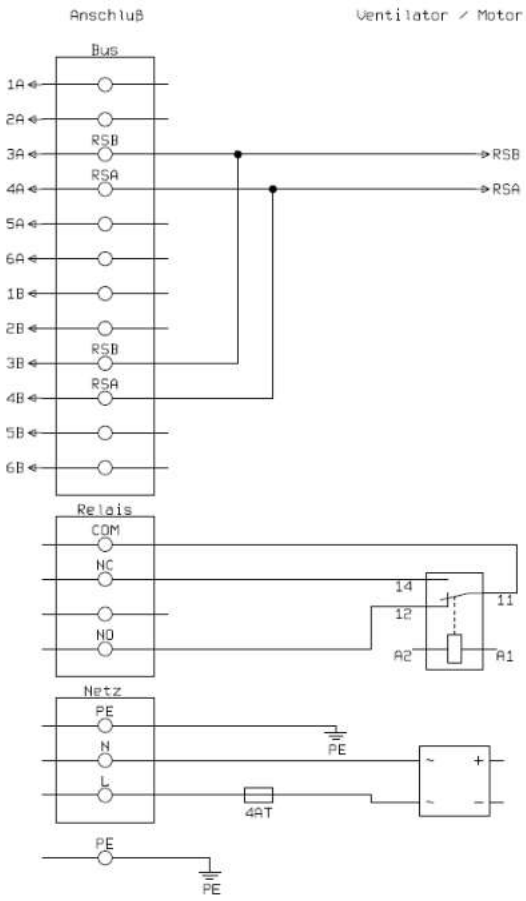
External PE lead “green/yellow” is brought out of device. Connect the PE lead with ring connector to metal parts around to assure proper grounding of the complete device.

Motor and control leads of the unit may not be laid out in parallel to the mains. Every precaution has to be taken to ensure that maximally possible distance is kept between supply and control leads.

6 Connection terminals



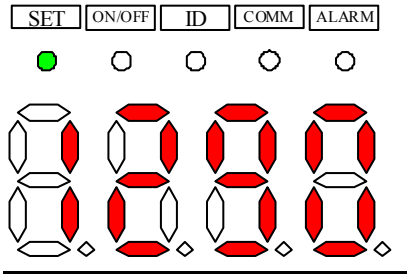
Pin-Nr.	Farbe	Belegung / Funktion
1	Rot	UB +15V, Spannungsversorgung
2	Braun	Hall 2
3	Blau	GND, Bezugsmasse
4		Nicht belegt
5		Nicht belegt
6	Schwarz	Motoranschluss U
7		Nicht belegt
8	Orange	Hall 1
9	Gelb	Hall 3
10	Schwarz	PTC
11	Grün/Gelb	Funktionserde
12	Blau	Motoranschluss V
13		Nicht belegt
14	Braun	Motoranschluss W



Klemme	Pin-Nr.	Anschluss	Belegung / Funktion
PE	-	PE	Zusätzliche Funktionserde, Ringzunge
Netz	1	PE	Schutzleiteranschluss
Netz	2	N	Versorgungsspannung, Neutralleiter, Spannungsbereich siehe Typenschild, 50/60Hz
Netz	3	L	Versorgungsspannung, Phase, Spannungsbereich siehe Typenschild, 50/60Hz
Relais	1	COM	Potentialfreier Statusmeldekontakt C, (125VAC/0,5A; 30VDC/1A, min.1mA, AC1)
Relais	2	NC	Potentialfreier Statusmeldekontakt A, Öffner bei Fehler
Relais	3		Nicht belegt
Relais	4	NO	Potentialfreier Statusmeldekontakt B, Schließer bei Fehler
Bus	1A, 2A		Nicht belegt
Bus	3A	RSB	RS485-Schnittstelle für ebmBUS, RSB, SELV
Bus	4A	RSA	RS485-Schnittstelle für ebmBUS, RSA, SELV
Bus	5A, 6A		Nicht belegt
Bus	1B, 2B		Nicht belegt
Bus	3B	RSB	RS485-Schnittstelle für ebmBUS, RSB, SELV
Bus	4B	RSA	RS485-Schnittstelle für ebmBUS, RSA, SELV
Bus	5B, 6B		Nicht belegt

7 Setting elements

keys and display:



5 status LED's

4 digit 7-segment display

mode, set, up, down keys

local operating possibility:

- set-value
- ON/OFF
- ebmBUS group address
- ebmBUS fan address
- maximum speed
- actual speed display

display only:

- alarm message (coded)

Error display - failure codes:

1	Phase failure (applicable for 3-phase AC input only)
6	Motor overheated
7	Hall sensor failure
8	Locked motor
10	Electronics overheated
13	DC-Link voltage too low



8 Operation

8.1 menu structure

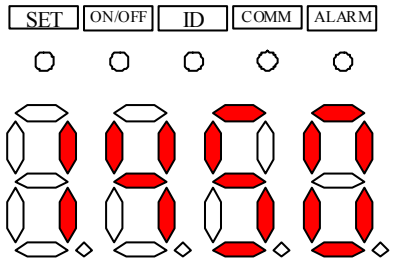
8.1.1 General

keys:

MODE	change menu item
UP	increase value step-wise
DOWN	decrease value step-wise
SET	activate value and jump to menu item actual value

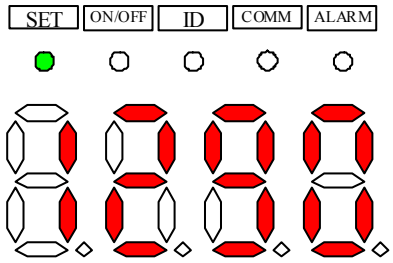
Value/Item will change step-wise by key-press, press and hold will change the value/item continuously. If no key is pressed for longer than 10s, menu item actual-value is activated automatically.

8.1.2 Actual speed



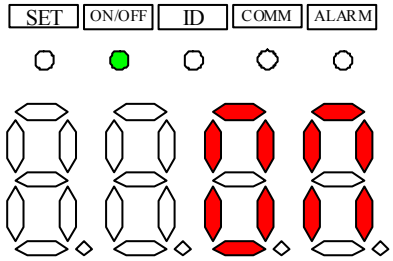
After power up and start-up delay the actual speed of the fan is displayed.
Pressing the “MODE“ key brings you to the item “Set-value” in the menu.

8.1.3 Set-value



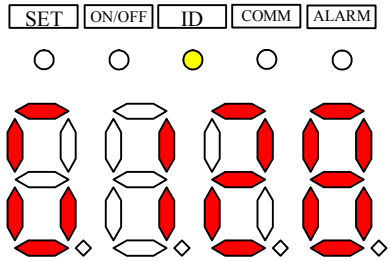
Set-value can be adjusted. Value is limited by maximum speed programmed.
Pressing the “MODE“ key brings you to the item “ON / OFF” in the menu.

8.1.4 Menü ON / OFF



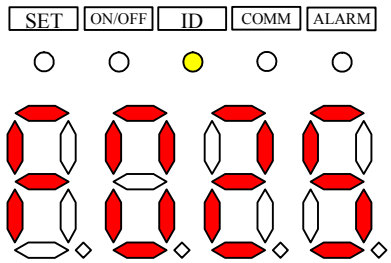
ON: motor is started using the set-speed programmed
OFF: motor is stopped

8.1.5 Group address



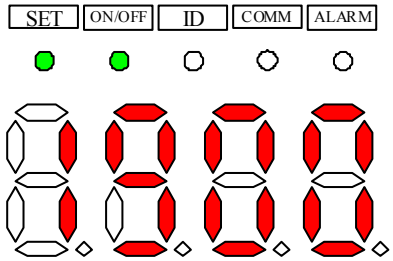
This item in the menu allows you to set the group address.
The menu item “Group address” can be recognised on the display by the G preceding the number of the group.
Modifying the group address is identical with the procedure for adapting the set speed.
Pressing the “MODE“ key brings you to the item “Fan address” in the menu.

8.1.6 Fan address



This item in the menu allows you to set the fan address.
The menu item “Fan address” can be recognised on the display by the F preceding the number of the fan.
Changing the fan address is identical with the procedure for adapting the set speed.
Pressing the “MODE“ key brings you to the item “Speed limit (maximum speed)” in the menu.

8.1.7 Speed limit (maximum speed)



The maximum admissible fan speed can be adjusted. The set-value is limited to this speed in rpm.
We recommend programming 1210 min^{-1} with R3G470-AA05-24, 1440 min^{-1} with R3G470-AB05-24

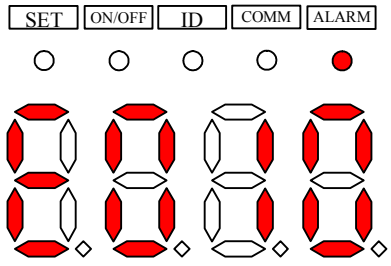
8.2 Protective features

Monitoring functions of the CHW035-AB02-01 unit

- Over-temperature electronics
- Over-temperature motor
- Locked-rotor
- Hall alarm

With any one of these faults occurring, the motor is stopped and the red alarm LED comes up.
Reset is possible by line cut-out and re-start, or via software reset by pressing the “Set” button.
Once an error occurred the related error code is displayed and the motor is stopped.
In case of motor block condition is detected the electronics will retry to start the motor automatically. If this retry has been successful the “Actual speed” will be displayed again.

8.3 Error display

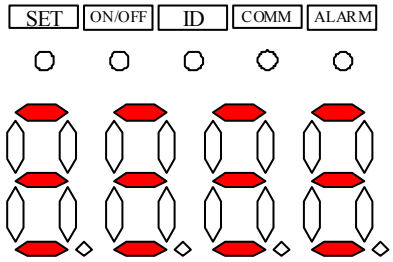


In case the fan is in failure mode (red LED is on), this item in the menu allows you to get details on the nature of the failure (failure code).
The menu item “Failure code” can be recognised on the display by the E preceding the 3-digit code describing the type of failure.

The following table helps to decode the numbers given:

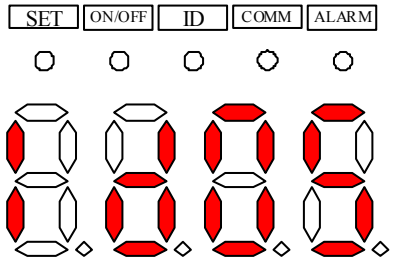
Code Failure
1 Phase failure (applicable for 3-phase AC input only)
6 Motor overheated
7 Hall sensor failure
8 Locked motor
10 Electronics overheated
13 DC-Link voltage too low

8.4 Initialization



During power-up the segments of the 4-digit display are activated like shown above for 1 second.

8.5 Start-up delay



There will be a delay for start-up in order to provide a cascaded start-up of the individual units. The delay time is derived from the device address programmed to the individual CHW035-AB02-01 unit according to following method:

even group address -> delay time = [fan address] seconds+ 31 seconds
odd group address -> delay time = [fan address] seconds

By this means the networked fans will not start at the same time but one after the other.

9 Safety

⚠ Our CHW035-AB02-01 is exclusively designed as a built-in device for moving air according to its technical data. Any other or secondary use is deemed improper and constitutes a misuse of the device. Installations on the customer's side must meet the mechanical, thermal and service life-related stresses that can occur. Only operate this unit in an environment with maximum contamination level 2.

⚠ Interference from electromagnetic radiation is possible, e.g. in conjunction with open and closed-loop control devices. If unacceptable emission intensities occur when the fan is installed, appropriate shielding measures have to be taken by the user. **Note! Electrical or electromagnetic interferences after integrating the device in installations on the customer's side.** Verify that the entire setup is EMC compliant!

⚠ **Warning!** Only specialised electrical personnel may install the device, perform the test run and work on the electrical system. Only trained and authorised specialist personnel are permitted to transport, unpack, assemble, operate or maintain the device, or to use it in any other manner.

⚠ **Warning!** Electric shock! When connecting unit to the mains, dangerous voltages occur. Terminals and connections have voltage even with a unit that is shut off and motor is stopped. **Capacitor discharge time.** Wait five minutes after disconnecting the voltage at all poles before opening the device.

⚠ **Warning!** Only pulse-current sensitive and/or universal RCD protective devices (Type B or B+) are permitted. Like frequency inverters, RCD protective devices cannot provide personal safety while operating the device. When switching on the power supply of the device, pulsed charge currents from the capacitors in the integrated EMC filter can lead to the RCD protective devices triggering without delay. We recommend residual current devices with a trigger threshold of 300 mA and delayed triggering (super-resistant, characteristic K).

⚠ **Warning!** Connecting a number of devices in parallel can cause dangerous charges of >50µC between line terminal and PE after line switch-off.

⚠ **Warning!** With electronics being enabled, the motor restarts automatically after power failure.