

# COMBIVERT F5

ADDITIONAL MANUAL | **INSTALLATION F5 HOUSING U**  
**SPECIAL DEVICE 28F5EAU-Y11H**

Translation of the original manual  
Document 20249312 EN 00

## NOTICE

This manual contains only supplementary information and is not valid on its own!

Observe the safety instructions of the following manuals!



► Instruction manual F5 housing U

[www.keb.de/fileadmin/media/Manuals/f5/power/u/00f50ebku00.pdf](http://www.keb.de/fileadmin/media/Manuals/f5/power/u/00f50ebku00.pdf)



► General safety instructions

[www.keb.de/fileadmin/media/Manuals/dr/ma\\_dr\\_gen-safety-instrct-20157737\\_en.pdf](http://www.keb.de/fileadmin/media/Manuals/dr/ma_dr_gen-safety-instrct-20157737_en.pdf)



# Preface

The described hard- and software are developments of the KEB Automation KG. The enclosed documents correspond to conditions valid at printing. Misprint, mistakes and technical changes reserved.

## Signal words and symbols

Certain operations can cause hazards during the installation, operation or thereafter. There are safety informations in the documentation in front of these operations. Security signs are located on the device or machine. A warning contains signal words which are explained in the following table:

<b>DANGER</b>	Dangerous situation, which will cause death or serious injury in case of non-observance of this safety instruction.
<b>WARNING</b>	Dangerous situation, which may cause death or serious injury in case of non-observance of this safety instruction.
<b>CAUTION</b>	Dangerous situation, which may cause minor injury in case of non-observance of this safety instruction.
<b>NOTICE</b>	Situation, which can cause damage to property in case of non-observance.

### RESTRICTION

Is used when certain conditions must meet the validity of statements or the result is limited to a certain validity range.

	Is used when the result will be better, more economic or trouble-free by following these procedures.
--	--

## More symbols

- ▶ This arrow starts an action step.
- / - Enumerations are marked with dots or indents.
- => Cross reference to another chapter or another page.



Note to further documentation.  
[www.keb.de/service/downloads](http://www.keb.de/service/downloads)



## Laws and guidelines

KEB Automation KG confirms with the EC declaration of conformity and the CE mark on the device nameplate that it complies with the essential safety requirements.

The EC declaration of conformity can be downloaded on demand via our website. Further information is provided in chapter "Certification".

## Warranty and liability

The warranty and liability on design, material or workmanship for the acquired device is given in the general sales conditions.



Here you will find our general sales conditions.  
[www.keb.de/terms-and-conditions](http://www.keb.de/terms-and-conditions)



Further agreements or specifications require a written confirmation.

## Support

Through multiple applications not every imaginable case has been taken into account. If you require further information or if problems occur which are not treated detailed in the documentation, you can request the necessary information via the local KEB Automation KG agency.

**The use of our units in the target products is outside of our control and therefore lies exclusively in the area of responsibility of the customer.**

The information contained in the technical documentation, as well as any user-specific advice in spoken and written and through tests, are made to best of our knowledge and information about the intended use. However, they are regarded as being only informal and changes are expressly reserved, in particular due to technical changes. This also applies to any violation of industrial property rights of a third-party. Selection of our units in view of their suitability for the intended use must be done generally by the user.

**Tests can only be done within the intended end use of the product (application) by the customer. They must be repeated, even if only parts of hardware, software or the unit adjustment are modified.**

## Copyright

The customer may use the instructions for use as well as further documents or parts from it for internal purposes. Copyrights are with KEB Automation KG and remain valid in its entirety.

This KEB product or parts thereof may contain third-party software, including free and/or open source software. If applicable, the license terms of this software are contained in the instructions for use. The instructions for use are already available to you, can be downloaded free of charge from the KEB website or can be requested from the respective KEB contact person.

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# 1 Basic Safety Instructions

The COMBIVERT is designed and constructed in accordance with state-of-the-art technology and the recognised safety rules and regulations. However, the use of such devices may cause functional hazards for life and limb of the user or third parties, or damages to the system and other material property.

The following safety instructions have been created by the manufacturer for the area of electric drive technology. They can be supplemented by local, country- or application-specific safety instructions. This list is not exhaustive. Non-observance of the safety instructions by the customer, user or other third party leads to the loss of all resulting claims against the manufacturer.

## NOTICE



### Hazards and risks through ignorance.

- ▶ Read the instructions for use !
- ▶ Observe the safety and warning instructions !
- ▶ If anything is unclear, please contact KEB Automation KG !

## 1.1 Target group

This instruction manual is determined exclusively for electrical personnel. Electrical personnel for the purpose of this instruction manual must have the following qualifications:

- Knowledge and understanding of the safety instructions.
- Skills for installation and assembly.
- Start-up and operation of the product.
- Understanding of the function in the used machine.
- Detection of hazards and risks of the electrical drive technology.
- Knowledge of [DIN IEC 60364-5-54](#).
- Knowledge of national safety regulations.

## 1.2 Validity of this manual

This manual describes the special device F5 28F5EAU-Y11H.

The manual

- contains only supplementary safety instructions.
- is only valid in connection with the instruction manual „COMBIVERT F5 housing U“.

### 1.3 Electrical connection

#### ⚠ DANGER



#### Voltage at the terminals and in the device!

##### Danger to life due to electric shock !

- ▶ For any work on the unit switch off the supply voltage and secure it against switching on.
- ▶ Wait until the drive has stopped in order, that perhaps regenerative energy can be generated.
- ▶ Wait until the DC-Link capacitors are discharged (5 minutes). Verify by measuring the DC voltage at the terminals.
- ▶ Never bridge upstream protective devices (also not for test purposes).

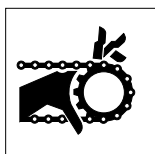
For a trouble-free and safe operation, please pay attention to the following instructions:

- The electrical installation shall be carried out in accordance with the relevant requirements.
- Cable cross-sections and fuses must be dimensioned by the user accordly to the specified minimum / maximum values for the operation.
- Within systems or machines the person installing electrical wiring must ensure that on existing or new wired safe ELV circuits the EN requirement for safe insulation is still met!
- For drive converters that are not isolated from the supply circuit (in accordance with [EN 61800-5-1](#)) all control lines must be included in other protective measures (e.g. double insulation or shielded, earthed and insulated).
- When using components without isolated inputs/outputs, it is necessary that equipotential bonding exists between the components to be connected (e.g. by the equipotential line). Disregard can cause destruction of the components by equalizing currents.

### 1.4 Start-up and operation

The drive converter must not be started until it is determined that the installation complies with the machine directive; Account is to be taken of [EN 60204-1](#).

#### ⚠ WARNING



#### Software protection and programming!

##### Hazards caused by unintentional behavior of the drive!

- ▶ Check especially during initial start-up or replacement of the drive converter if parameterization is compatible to application.
- ▶ Securing a unit solely with software-supported functions is not sufficient. It is imperative to install external protective measures (e.g. limit switch) that are independent of the drive converter.
- ▶ Secure motors against automatic restart.

## 2 Technical Data

<b>Device size</b>		<b>28</b>
<b>Housing</b>		<b>U</b>
<b>Cooling mode</b>		<b>Liquid cooler</b>
<b>Rated power</b>		
Rated motor power	$P_{mot} / \text{kW}$	200
Rated apparent output power	$S_{out} / \text{kVA}$	256
<b>Input data</b>		
Rated input voltage	<sup>1)</sup> $U_N / \text{V}$	400 (UL: 480)
Input voltage range	$U_{in} / \text{V}$	305...528 ± 0
Mains phases		3
Mains frequency	$f_N / \text{Hz}$	50 / 60 ± 2
Rated input current	$I_{in} / \text{A}$	400
Permitted mains forms		TN, TT, IT <sup>2)</sup> , Δ mains <sup>3)</sup>
Max. permissible mains fuse gG	<sup>4)</sup> $I_{net} / \text{A}$	550
<b>Output data</b>		
Output voltage	<sup>5)</sup> $U_{out} / \text{V}$	0... $U_{in}$
Output frequency	<sup>6)</sup> $f_{out} / \text{Hz}$	0...800
Min. output frequency at continuous full load	$f_{out\_min} / \text{Hz}$	100
Output phases		3
Rated output current	$I_{out} / \text{A}$	370
Standstill continuous current at 8 kHz	<sup>7)</sup> $I_{out\_ST} / \text{A}$	220
Max. short-time current limit 30s	<sup>8)</sup> $I_{OL} / \text{A}$	463
Overcurrent	$I_{OC} / \text{A}$	555
Min. switching frequency	$f_{s\_min} / \text{kHz}$	8
Max. switching frequency	$f_{s\_max} / \text{kHz}$	8
<b>Power dissipation</b>		
Total power dissipation at rated operation	$P_D / \text{kW}$	5.4
Heat power dissipation at rated operation	<sup>9)</sup> $P_{D\_w} / \text{kW}$	4.6
<b>DC link data</b>		
Operating voltage range DC	$U_{in\_dc} / \text{V}$	420...746 ± 0
DC link capacity	$C_{int} / \mu\text{F}$	16800
Power OFF DC	$U_{Poff\_dc} / \text{V}$	200
Undervoltage level DC	$U_{UP\_dc} / \text{V}$	240
Overvoltage level DC	$U_{OP\_dc} / \text{V}$	840
<b>Operating conditions liquid cooler</b>		
Max. heat sink temperature (OH)	$t_{max} / ^\circ\text{C}$	73
Max. flow temperature	$t_{in\_max} / ^\circ\text{C}$	36
Min. volume flow	$Q / \text{l/min}$	15
Max. permissible operating pressure	$p_{max} / \text{bar}$	10
<i>Table 1: Technical Data</i>		

<sup>1)</sup> At rated voltages  $\geq 460 \text{ V}$  multiply the rated current with factor 0.86.

<sup>2)</sup> Restrictions when using HF filters.

<sup>3)</sup> Phase conductor grounded mains are only permissible without HF filters.

<sup>4)</sup> Fuse protection according to UL => Installation manual F5 housing U.

<sup>5)</sup> The voltage at the motor is dependent on the series-connected devices and on the control method.

<sup>6)</sup> The output frequency is to be limited in such way that 1/10 of the switching frequency is not exceeded.

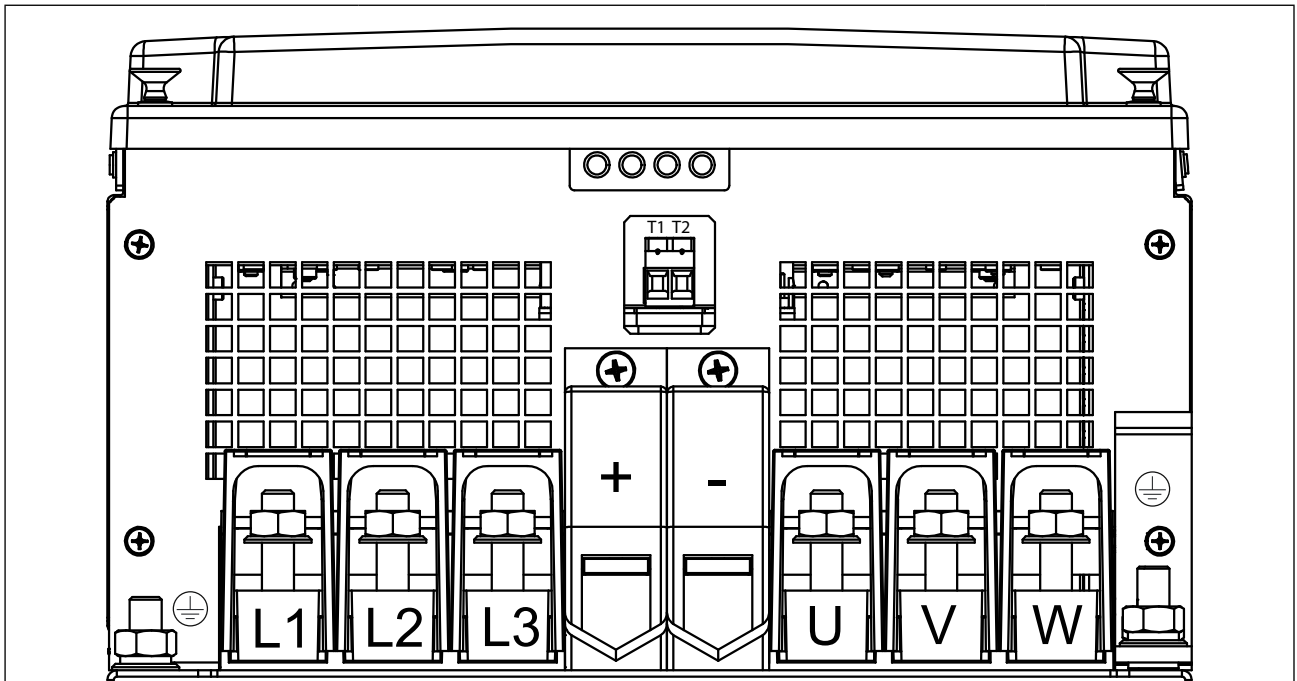
<sup>7)</sup> Max. current before the OL2 function triggers (not in operating mode F5 GENERAL).

<sup>8)</sup> With the regulated systems 5% are to be subtracted as overmodulation capacity.

<sup>9)</sup> Applies to 460 V  $U_{in}$ , 100% utilization, 15 l/min volume flow and 40°C flow temperature.



## 2.1 Installation and connection



Name	Function	No. <sup>1)</sup>
L1, L2, L3	3-phase mains connection	3
U, V, W	Motor connection	
+, -	DC link voltage DC 420...746V (400V class) Connection for braking module, filter or DC link coupling (not suitable for DC supply)	1
T1, T2	Connection for temperature sensor	2
⊕	Connection for shielding/earthing	3

Figure 1: Terminals

<sup>1)</sup> For the corresponding cable cross-sections and tightening torques => „Permissible cable cross-sections and tightening torques of the terminals“.

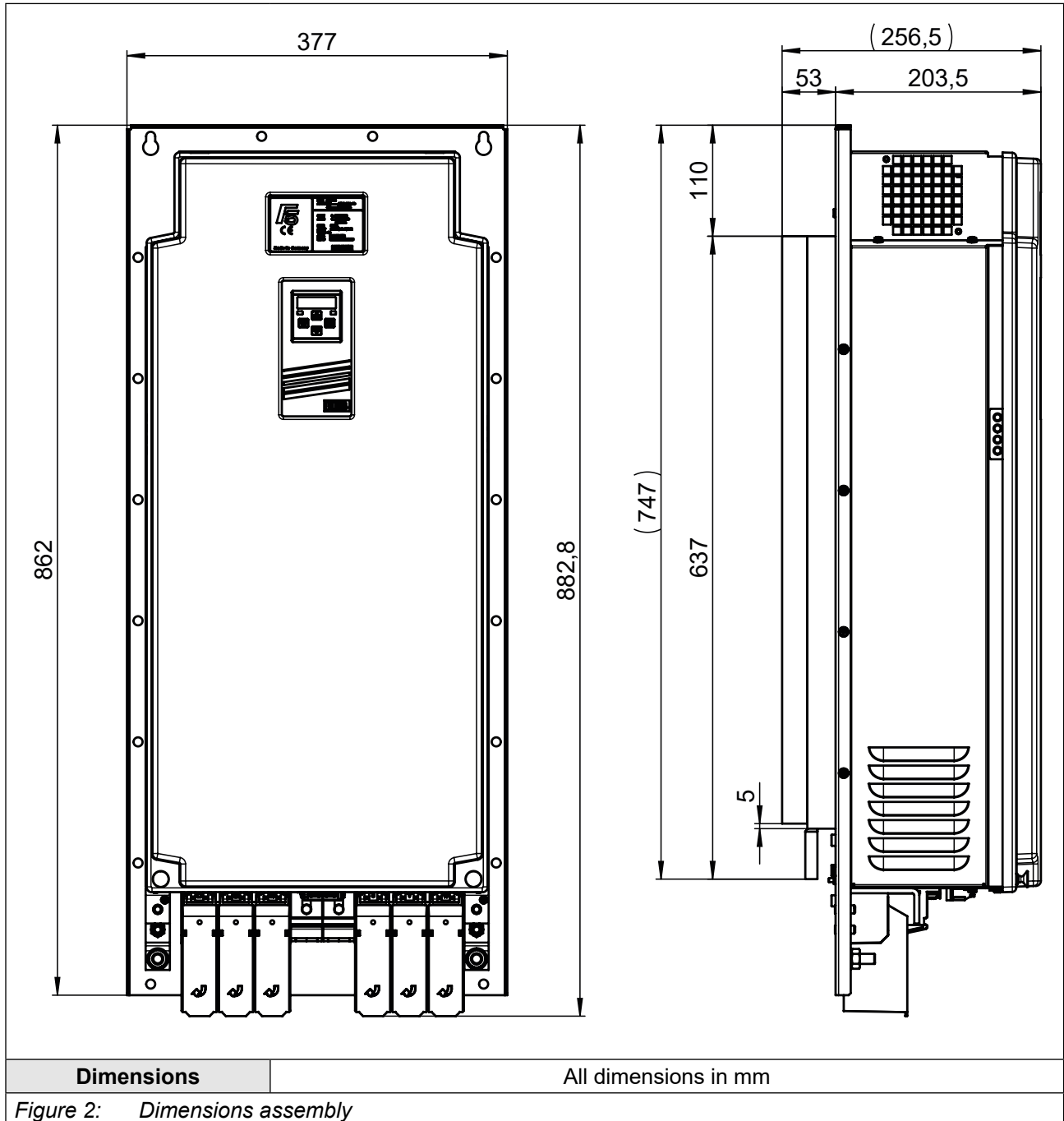
## 2.2 Permissible cable cross-sections and tightening torques of the terminals

No.	Permissible cross-section flexible with wire-end ferrule				Maximum tightening torque	
	mm <sup>2</sup>		AWG/MCM		Nm	lb inch
	min.	max.	min.	max.		
1	50	150	1/0 AWG	300 MCM	25...30	270
2	0.2	4	24AWG	10AWG	0.6	5.3
3	10 mm stud for ring crimp connector				25	220

Table 2: Permissible cable cross-sections and tightening torques of the terminals

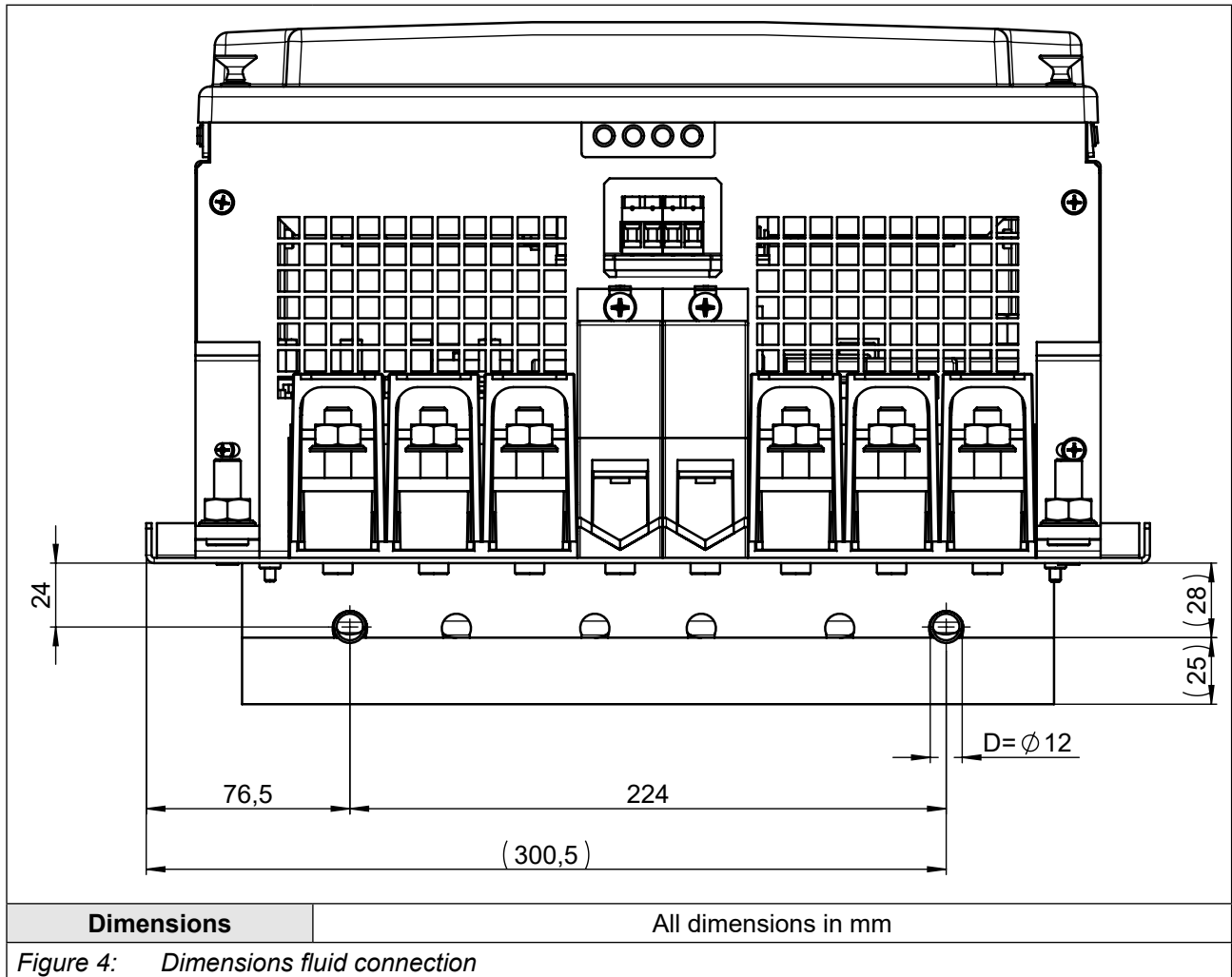
### 3 Dimensions

#### 3.1 Dimensions assembly

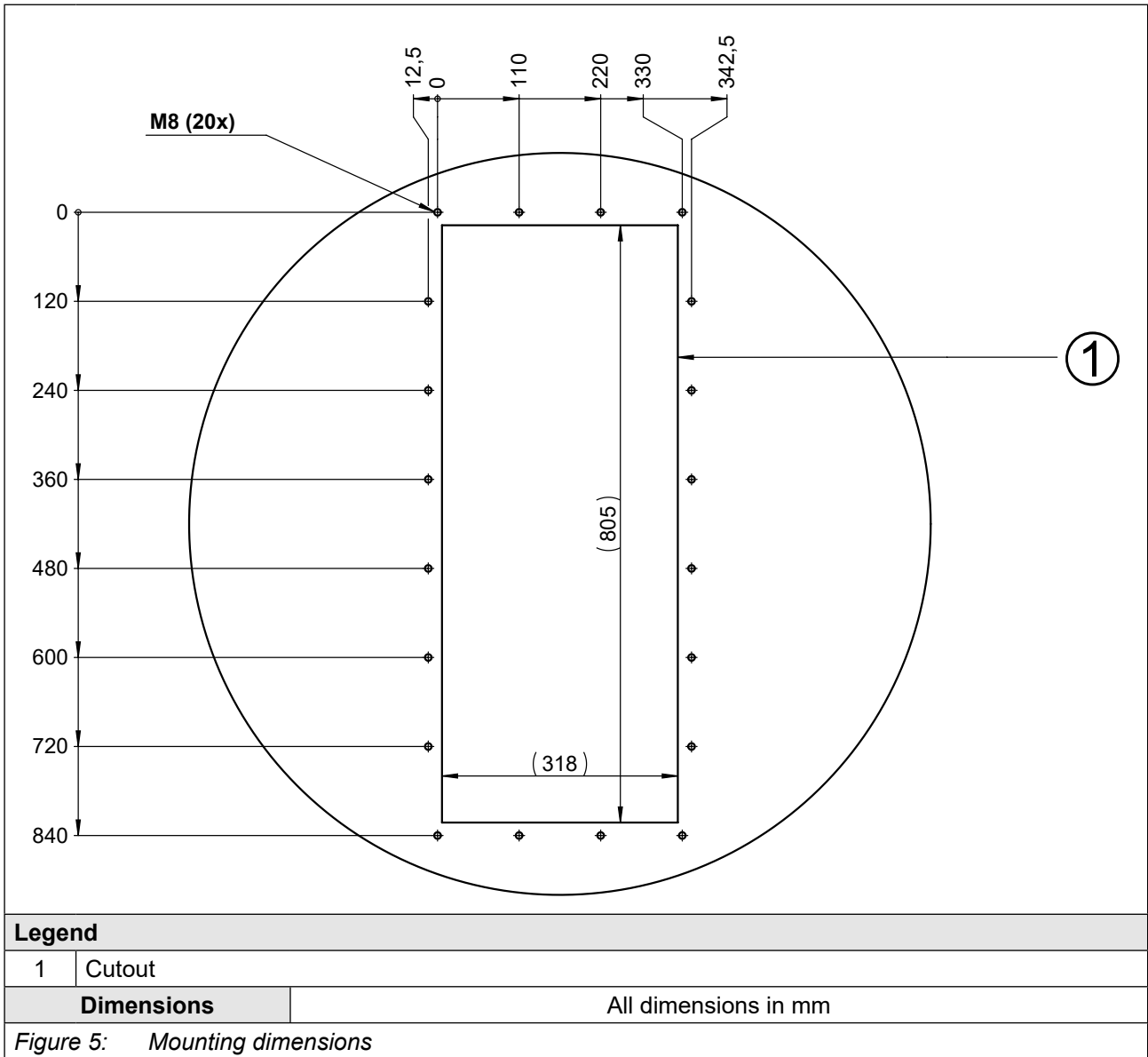




3.3 Dimensions fluid connection



3.4 Mounting dimensions



## 4 Revision History

Version	Date	Description
00	2020-11	Completion of the series version

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