Your Global Automation Partner

TURCK

IMX12-CCM05...
Cabinet Guard

Instructions for Use

Contents

1 About these instructions

These instructions for use describe the structure, functions and the use of the product and will help you to operate the product as intended. Read these instructions carefully before using the product. This is to avoid possible damage to persons, property or the device. Retain the instructions for future use during the service life of the product. If the product is passed on, pass on these instructions as well.

1.1 Target groups

These instructions are aimed at qualified personnel with knowledge of explosion protection (e.g. EN 60079-14 etc.) and must be carefully read by anyone mounting, commissioning, operating, maintaining, dismantling or disposing of the device.

1.2 Explanation of symbols used

The following symbols are used in these instructions:

	**DANGER** DANGER indicates a dangerous situation with high risk of death or severe injury if not avoided.
	**WARNING** WARNING indicates a dangerous situation with medium risk of death or severe injury if not avoided.
	**CAUTION** CAUTION indicates a dangerous situation of medium risk which may result in minor or moderate injury if not avoided.
	**NOTICE** NOTICE indicates a situation which may lead to property damage if not avoided.
	**NOTE** NOTE indicates tips, recommendations and useful information on specific actions and facts. The notes simplify your work and help you to avoid additional work.
▶	**CALL TO ACTION** This symbol denotes actions that the user must carry out.
⇨	**RESULTS OF ACTION** This symbol denotes relevant results of actions.

1.3 Other documents

Besides this document, the following material can be found on the Internet at www.turck.com:

- Data sheet
- Quick Start Guide
- Approvals
- Declarations of Conformity (current version)

1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to techdoc@turck.com.

2 Notes on the product

2.1 Product identification

These instructions apply to the following cabinet guards:

- IMX12-CCM05-MTI-1I2T-HC/L
- IMX12-CCM05-MTI-1I2T-HC/L/CC

2.2 Scope of delivery

The scope of delivery includes:

- Cabinet guard
- Quick Start Guide
- Adhesive foil (Target) for attaching reflective surfaces

2.3 Turck service

Turck supports you with your projects, from initial analysis to the commissioning of your application. The Turck product database under www.turck.com contains software tools for programming, configuration or commissioning, data sheets and CAD files in numerous export formats.

The contact details of Turck subsidiaries worldwide can be found on p. [▷ 18].

3 For your safety

The product is designed according to state-of-the-art technology. However, residual risks still exist. Observe the following warnings and safety notices to prevent damage to persons and property. Turck accepts no liability for damage caused by failure to observe these warning and safety notices.

3.1 Intended use

The IMX12-CCM… cabinet guard monitors temperature, relative air humidity and the door status in control cabinets. The devices are suitable for operation in Zone 1.

The devices may only be used as described in these instructions. Any other use is not in accordance with the intended use. Turck accepts no liability for any resulting damage.

3.2 Obvious misuse

- The device is not a safety component and must not be used for the protection of persons and property.

3.3 General safety instructions

- The device meets the EMC requirements for industrial areas. When used in residential areas, take measures to avoid radio interference.
- The device may only be assembled, installed, operated, parameterized and maintained by professionally-trained personnel.
- The device may only be used in accordance with applicable national and international regulations, standards and laws.
- The device must only be used in enclosed housing or control cabinets.

3.4 Notes on Ex protection

- When operating the device in a hazardous area, the user must have a working knowledge of explosion protection (IEC/EN 60079-14, etc.).
- Observe national and international regulations for explosion protection.
- Only use the device in Ex areas when installed in the appropriate protective housing.
- Only use the device within the permitted operating and ambient conditions (see certification data and Ex approval requirements for use in Ex area).
- Cables and terminals with intrinsically safe circuits must be indicated — use light blue for color-coding. Separate cables and terminals from non-intrinsically safe circuits or isolate accordingly (IEC/EN 60079-14).
- Complete certification of intrinsic safety.
- Never connect equipment to intrinsically safe circuits if this equipment was previously used once in non-intrinsically safe circuits.

4 Product description

The IMX12-CCM05... cabinet guards are available with removable screw or spring-loaded terminals.

4.1 Device overview

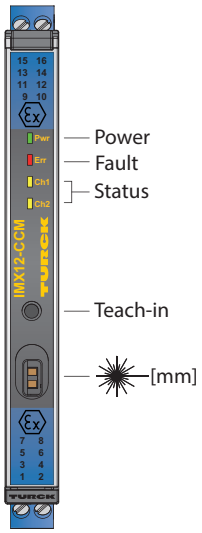

fig. 1: IMX12-CCM05… – front view

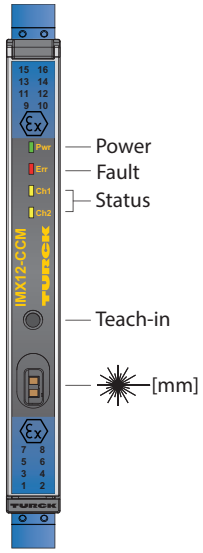

fig. 2: IMX12-CCM05…CC – front view

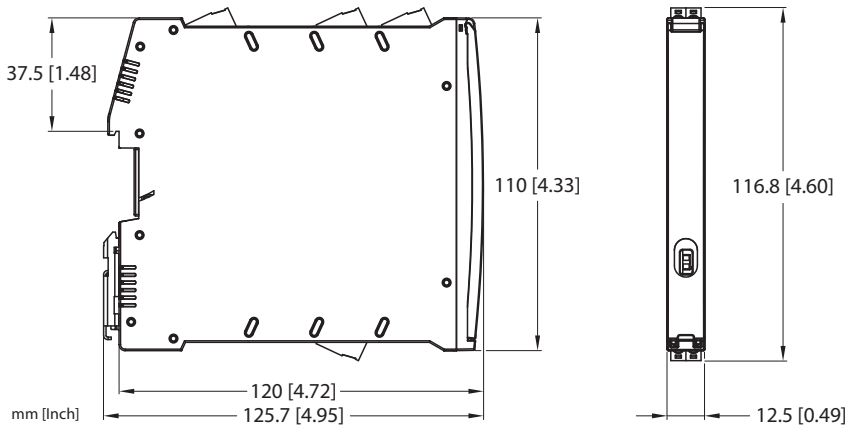

fig. 3: Dimensions – IMX12-CCM05…

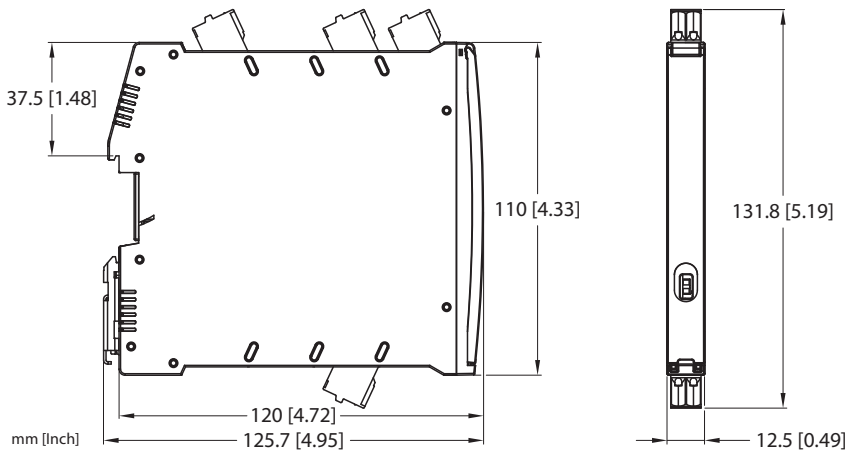

fig. 4: Dimensions – IMX12-CCM05…CC

4.1.1 Indication elements

The devices each have a green Power LED (Pwr). A red Error LED and two yellow Status LEDs are also provided.

4.2 Properties and features

- Sensors for monitoring humidity, temperature and distance
- Teach-in to ambient conditions
- Device variants with screw or spring-loaded terminal connection
- Freely configurable switching outputs (NC/NO contacts)
- Input for potential-free switching contact

4.3 Operating principle

The cabinet guards of the IMX12-CCM… series monitor temperature, humidity and door status (open/closed) in control cabinets within the set limit parameters. An humidity/temperature sensor and a distance sensor are used to detect the ambient conditions. Values above or below the limits are indicated and reported by LEDs and the corresponding switching output. The switching contacts indicate limit value overshoots and undershoots to the higher field level.

4.4 Functions and operating modes

The devices use integrated sensors to monitor temperature, humidity and the status the control cabinet door. For this the measured values are automatically compared with the defined limit values. The device automatically reports limit value overshoots. Two potential-free, galvanically isolated switching contacts are provided for this.

The devices can be parameterized via a teach-in function and the HART interface. Potential-free switching contacts, such as REED sensors, can be connected to the device via a digital input.

5 Installing

DANGER
Explosive atmosphere
Risk of explosion due to spark ignition!

- ▶ Operation in zone 1: Mount the device in an enclosure in accordance with IEC/EN 60079-0 and with a degree of protection of at least IP54.
- ▶ Operation in zone 1: When mounting the device, ensure that its permissible operating temperature is not exceeded even in unfavorable ambient conditions.

NOTICE
Reflective surfaces
Malfunction when monitoring the control cabinet door

- ▶ Cover glass and highly reflective surfaces on the control cabinet door with matt adhesive foil (supplied with the device).

The device can be mounted on a DIN rail according to EN 60715 (TH35).

- ▶ Fasten the device vertically and free-standing on a DIN rail.
- ▶ Observe a minimum clearance of 40 mm between the housing front and control cabinet door.

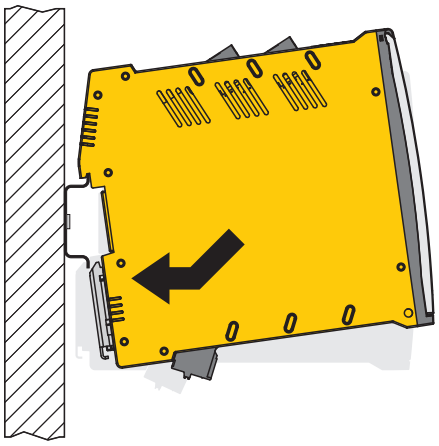

fig. 5: DIN rail mounting

6 Connection

WARNING
Consequential damage through incorrect connection
Explosion through device damage!
- Observe the connection requirements in all cases.

The inputs and outputs as well as the supply voltage can be connected by screw or spring-loaded terminals, depending on device type. The removable terminal blocks are coded.

6.1 Connecting devices with screw terminals

- Only use cables (rigid or flexible) with a cross section of 0.2…2.5 mm².
- When using stranded wire: Secure the wire ends with ferrules.
- Insert the stripped cable ends into the guides of the cable glands.
- Tighten screws. The max. tightening torque is 0.5 Nm.

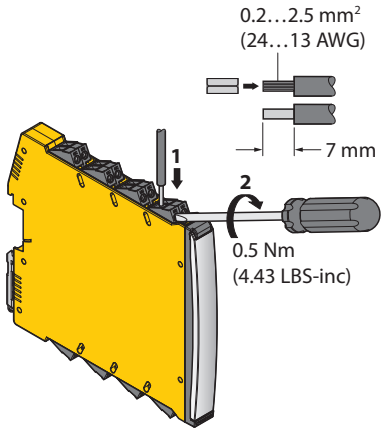

fig. 6: Connecting devices with screw terminals

6.2 Connecting devices with spring-loaded terminals

- Only use cables (rigid or flexible) with a cross section of 0.2…2.5 mm².
- When using stranded wire: secure the wire ends with ferrules.
- Prise open the spring-loaded terminals using a screwdriver.
- Insert the stripped cable ends into the guides of the spring-loaded terminals.
- Remove the screwdriver.

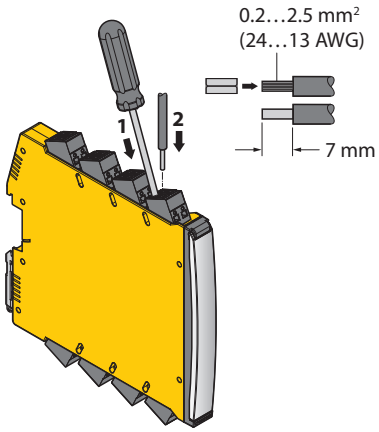

fig. 7: Connecting the power supply via spring-loaded terminals

6.3 Wiring diagram

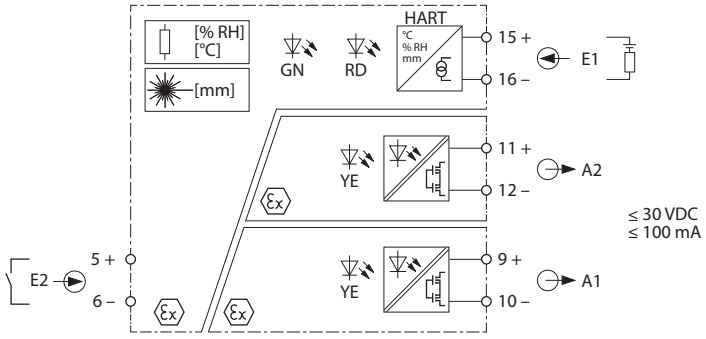

fig. 8: IMX12-CCM05… wiring diagram

7 Commissioning

The device is operational automatically once the cables are connected and the power supply is switched on.

NOTE
Turck recommends that the short circuit monitoring is deactivated when the device is supplied by a DCS/PLC card.

8 Operation

In normal operation, the device performs the following processes automatically:

- Reading configuration data
- Recording current measured values (temperature, humidity, door gap, contact E2)
- Monitoring measured values for limit value overshoots and undershoots

If an error occurs during normal operation at one of the integrated sensors, the Err LED is red and the current consumption increases to > 20 mA.

8.1 LEDs

The devices each have a green Power LED (Pwr). A red (Err) LED and two status LEDs (Ch1 and Ch2) are also provided.

The LEDs have the following indication functions:

LED	Color	Meaning
Pwr	Green	Device is operational
	Green flashing (0.5 Hz)	Teach-in running
Err	Red	Error at one or multiple sensors
	Short red	Manual input error
	Red flashing (0.5 Hz)	Error during teach-in
Ch1	Yellow	Limit value at channel 1 overshot or undershot
	Off	Parameters within the limit values
Ch2	Yellow	Limit value at channel 2 overshot or undershot
	Off	Parameters within the limit values

8.2 Reading process values via the HART interface

The sensor process values can be read via the HART interface. The process values can be read via the HART variables with HART command 3. The HART variables for the process values can be taken from the following table:

Process value	HART variables	Meaning
Temperature	PV unit code	Unit in °C
	PV	Temperature value
Relative air humidity	SV unit code	Unit in %
	SV	Value for relative air humidity
Distance	TV unit code	Unit in mm
	TV	Distance value

9 Setting

The current values for temperature, humidity and door gap at the particular mounting situation can be recorded with a teach-in operation. The preset additional values to calculate the limit value as a percentage can be taken from the preset parameters. The lower and upper limit values for the particular mounting situation can alternatively be set via the HART interface. The teach-in operation is controlled by the pushbutton on the front. The tuning time for the limit values is 30…1440 min.

- ▶ Press the pushbutton for 2…6 s.
- ⇨ The Pwr LED flashes green.

The following limit values are preset in the device:

Parameter	Lower limit value	Upper limit value
Temperature	-25 °C	+70 °C
Humidity	0 %	80 %
Door gap	4 cm	130 cm

9.1 Setting the device values via the HART interface

The devices can be configured and parameterized with the HART interface. This requires the following components:

- FDT/DTM for IMX12-CCM… (free download at www.turck.com)
- HART modem

Preset parameters

Parameter	Value
Temperature hysteresis	5 K
Humidity hysteresis	5 %
Door gap hysteresis	5 mm
Addition for temperature limit value calculation	20 %
Addition for humidity limit value calculation	10 %
Addition for door gap limit value calculation	5 %
Measurement interval	1 s
Adjustment time for automatic calibration	240 min
Max. number of limit value overshoots before notification (temperature)	2
Max. number of limit value overshoots before notification (humidity)	2
Max. number of limit value overshoots before notification (door gap)	3
Type of switching outputs	NO
Hysteresis for temperature/humidity/door gap	On
Automatic limit value calculation	On
Manual calibration process	Possible

10 Troubleshooting

NOTICE
Reflective surfaces
Malfunction when monitoring the control cabinet door

- ▶ Cover glass and highly reflective surfaces on the control cabinet door with matt adhesive foil (supplied with the device).

If the device does not function as expected, first check whether ambient interference is present. If there is no ambient interference present, check the connections of the device for faults.

If there are no faults, there is a device malfunction. In this case, decommission the device and replace it with a new device of the same type.

11 Maintenance

Ensure that the plug connections and cables are always in good condition.

The devices are maintenance-free, clean dry if required.

12 Repair

The device must not be repaired by the user. The device must be decommissioned if it is faulty. Observe our return acceptance conditions when returning the device to Turck.

12.1 Returning devices

Returns to Turck can only be accepted if the device has been equipped with a Decontamination declaration enclosed. The decontamination declaration can be downloaded from
https://www.turck.de/en/retoure-service-6079.php
and must be completely filled in, and affixed securely and weather-proof to the outside of the packaging.

13 Decommissioning

- Separate connections and the power supply.
- Undo the terminal connections on the device.
- Remove the device from its rail fixing as shown in the figures.

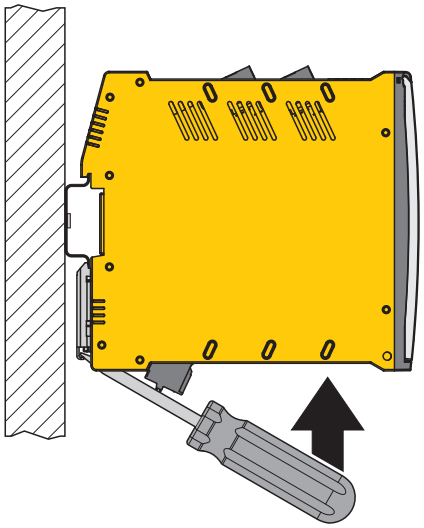

fig. 9: Undo the device with the screwdriver

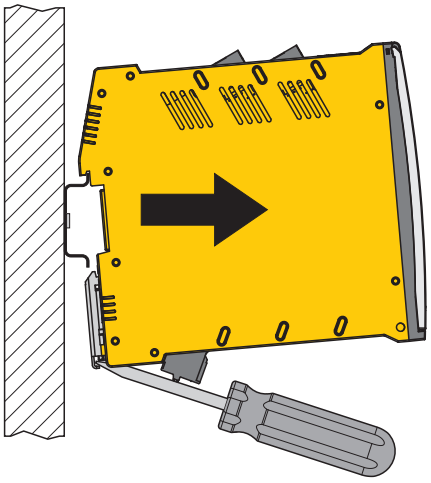

fig. 10: Remove the device from the DIN rail

14 Disposal

The devices must be disposed of properly and do not belong in the domestic waste.

15 Technical data

Technical data	IMX12-CCM05-MTI-1I2T-HC/L	IMX12-CCM05-MTI-1I2T-HC/L/CC
ID	100030579	100030580
Power supply	0…20 mA current loop	
Operating voltage	10…28 VDC	
Power consumption	≤ 0.32 W	
Internal sensors		
Distance	Triangulations sensor 4…130 cm (relative accuracy < ±1.5 mm, absolute accuracy < ±20 mm)	
Humidity	Humidity sensor 0…100 % rel. hum. (±2 % RF in the range 10…90 %)	
Temperature	Temperature sensor -25…+70 °C (±0.2 °C at 0…65 °C)	
Digital outputs		
Switching output 1 and 2	< ±30V, < 100 mA (ambient temperature < 45 °C)	
Digital input		
Potential-free contact	NO	
Operational readiness	Green	
Switching status	Yellow	
Error message	Red	
Electrical connection		
Terminals	Screw terminals, 2-pin, pluggable, coded	Spring-loaded terminals, 2-pin, pluggable, coded
Terminal cross-section	0.2…2.5 mm²	
Mechanical properties		
Dimensions (W × H × D)	120 × 12.5 × 117 mm	120 × 12.5 × 128 mm
Weight	135 g	
Fixing type	Mounting on DIN rail (NS25)	
Housing material	Polycarbonate/ABS	
Ambient conditions		
Ambient temperature	-25…+70 °C	
Storage temperature	-25…+80 °C	
Protection type	IP20	
Flammability class per UL 94	V-0	
Pollution degree	II	
Operating height	max. 2000 m above sea level	
Standards		
Voltage resistance and insulation	EN 50178, EN 61010-1	
Vibration test	Acc. to EN 60068-2-6	
Shock testing	Acc. to EN 60068-2-27	
Temperature	EN 60068-2-1 Ad, EN 60068-2-1 Bd, EN 60068-2-1	
Air humidity	EN 60068-2-38	
EMC	Acc. to EN 61000-4-2/-3/-4/-5/-6/-8, acc. to NAMUR NE21	
MTBF at 20 °C	358 years	
MTBF at 40 °C	154 years	

16 Appendix: Approvals and markings

Approvals	
IBExU 16 ATEX 1005 CE 0102	Ex II 2 G Ex ib op is IIC T4 Gb
CML 21UKEX21126 UKCA 2503	
IECEx IBE 16.0007	Ex ib op is IIC T4 Gb

Ambient temperature T_{amb}: -25…+70 °C

17 Turck subsidiaries — contact information

Germany	Hans Turck GmbH & Co. KG Witzlebenstraße 7, 45472 Mülheim an der Ruhr **www.turck.de**
Australia	Turck Australia Pty Ltd Building 4, 19-25 Duerdin Street, Notting Hill, 3168 Victoria **www.turck.com.au**
Austria	Turck GmbH Graumanngasse 7/A5-1, A-1150 Wien **www.turck.at**
Belgium	TURCK MULTIPROX Lion d'Orweg 12, B-9300 Aalst **www.multiprox.be**
Brazil	Turck do Brasil Automação Ltda. Rua Anjo Custódio Nr. 42, Jardim Anália Franco, CEP 03358-040 São Paulo **www.turck.com.br**
Canada	Turck Canada Inc. 140 Duffield Drive, CDN-Markham, Ontario L6G 1B5 **www.turck.ca**
China	Turck (Tianjin) Sensor Co. Ltd. 18,4th Xinghuazhi Road, Xiqing Economic Development Area, 300381 Tianjin **www.turck.com.cn**
Czech Republic	TURCK s.r.o. Na Brne 2065, CZ-500 06 Hradec Králové **www.turck.cz**
France	TURCK BANNER S.A.S. 11 rue de Courtalin Bat C, Magny Le Hongre, F-77703 MARNE LA VALLEE Cedex 4 **www.turckbanner.fr**
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Korea	Turck Korea Co, Ltd. B-509 Gwangmyeong Technopark, 60 Haan-ro, Gwangmyeong-si, 14322 Gyeonggi-Do **www.turck.kr**
Malaysia	Turck Banner Malaysia Sdn Bhd Unit A-23A-08, Tower A, Pinnacle Petaling Jaya, Jalan Utara C, 46200 Petaling Jaya Selangor **www.turckbanner.my**
Mexico	Turck Comercial, S. de RL de CV Blvd. Campestre No. 100, Parque Industrial SERVER, C.P. 25350 Arteaga, Coahuila **www.turck.com.mx**
Netherlands	Turck B. V. Ruiterlaan 7, NL-8019 BN Zwolle **www.turck.nl**
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Romania	Turck Automation Romania SRL Str. Siriului nr. 6-8, Sector 1, RO-014354 Bucuresti **www.turck.ro**
Russian Federation	TURCK RUS OOO 2-nd Pryadilnaya Street, 1, 105037 Moscow **www.turck.ru**
Sweden	Turck Sweden Office Fabriksstråket 9, 433 76 Jonsered **www.turck.se**
Singapore	TURCK BANNER Singapore Pte. Ltd. 25 International Business Park, #04-75/77 (West Wing) German Centre, 609916 Singapore **www.turckbanner.sg**
South Africa	Turck Banner (Pty) Ltd Boeing Road East, Bedfordview, ZA-2007 Johannesburg **www.turckbanner.co.za**
Turkey	Turck Otomasyon Ticaret Limited Sirketi Inönü mah. Kayisdagi c., Yesil Konak Evleri No: 178, A Blok D:4, 34755 Kadiköy/ Istanbul **www.turck.com.tr**
USA	Turck Inc. 3000 Campus Drive, USA-MN 55441 Minneapolis **www.turck.us**

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