

CEGA FORANO  
BY GREGGERSEN



PRODUCT CATALOG  
FORANO

## Forano Terminal Unit

ACCORDING TO DIN EN ISO 9170-1

### GENERAL

According to national and international standards, terminal units are the points that connect medical appliances to the gas supply system. The prize-winning FORANO terminal units can be flexibly integrated into every conceivable installation. Ease of handling guarantees smooth running in routine hospital practice.

Our Anaesthetic Gas Scavenging System controls the safe use of anaesthetic gases. Our Air-Motor system supplies the energy to drive your compressed air-operated tools.

### USAGE

The unit is used to withdraw compressed gases and vacuum from a central medical gas supply system in line with DIN EN ISO 7396-1; Anaesthetic Gas Scavenging System in line with DIN EN ISO 7396-2; integration of plugs and medical appliances with plug-in connections in line with DIN 13260-2.

### STRUCTURE AND FUNCTIONS

The terminal unit comprises a gas-specific basic block (rear part) and a connector mounting (front part) which are joined together. The front part can be adjusted (rotated). All movable parts are made of metal materials. The terminal unit thus in general has a very low-wear construction.



All three O-ring seals are combined in a maintenance-friendly way in an assembly – the cartridge – which can easily be replaced by removing the front part. The cartridge is marked with a LOT number so that the age of the sealing elements can be immediately identified. The plug in the connector mounting is kept either in the parking or the operating position.



**Labelling:** Type of gas written out in German and English plus chemical symbol (laser-inscribed in a wipe-resistant and tamper-proof way).

**Colour coding:** neutral or in line with DIN EN ISO 5359.

### TECHNICAL DATA

**Design:** pearl gloss, chrome-plated all-metal construction with parking and operating position; unlocking by means of the actuator; single-handed operation when connecting/disconnecting; manually lockable servicing valve.

**Types of installation:** concealed and hollow wall installation, surface mounting, installation into bed-head units or into ceiling-mounted supply units.

**Operating pressure:**

400 kPa to 500 kPa (overpressure) – compressed gases  
700 kPa to 1000 kPa (overpressure) – Airmotor  
<60 kPa (absolute pressure) – vacuum

The terminal unit FORANO has won three of the world's most prestigious design awards and has been nominated for the 2010 Design Prize of the Federal Republic of Germany.



## Terminal Unit Forano

INTELLIGENT CLOSING SYSTEM

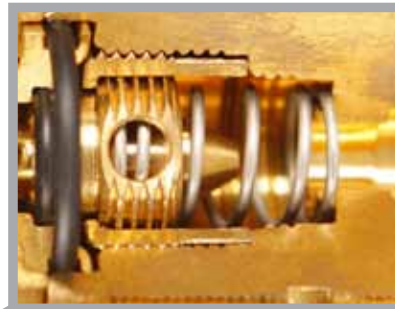
### INTELLIGENT, SIMPLE, SECURE

The Forano terminal unit is the only medical gas outlet on the market with an intelligent closing system offering three closing functions:

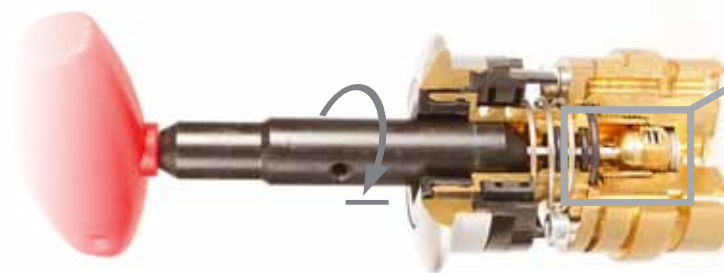
1. It seals the terminal unit when the plug connector is disconnected.
2. The front part of the terminal unit can be dismantled without interrupting the gas supply and the wear parts can be replaced.

3. The terminal unit can be shut off using a special key without dismantling the front part. The front part is then sealed with a warning sticker (art. no. 903.309) (see p. 5).

Thus each terminal unit can be shut off individually, eliminating the need to shut off individual areas or entire wards of the hospital if servicing or repairs need to be performed.



Forano terminal unit in non-shut-off mode. The special tool with a centering aid to shut off the terminal unit is already inserted.



After approx. 3-4 rotations, the rear part of the terminal unit is sealed gas-tight. Maintenance work, for example the replacement of the sealing cartridge or replacement of the entire front part, can be easily performed under operating pressure.



### STICKER "OUT OF ORDER!"

When shutting off a terminal unit or entire sections of the mains supply, the corresponding terminal units must be clearly marked. For this purpose, we offer you a sticker especially for the terminal unit Forano to paste over the connector mounting.

Please see page 18 / TOOLS AND ACCESSORIES



### TEST KIT FOR TERMINAL UNIT SYSTEM FORANO

in accordance with DIN EN ISO 7396-1/2

#### Consisting of:

- Test block with flow pipe for compressed gases
- Test block with flow pipe for vacuum/ NGA/AGSS
- Air motor test device
- Leak tightness measurement device
- Particle test device
- Filter box
- Gas-specific plug connector in accordance with DIN 13260:
  - Connector for oxygen (O<sub>2</sub>)
  - Connector for compressed air (AIR)
  - Connector for vacuum (VAC)
  - Connector for carbon dioxide (CO<sub>2</sub>)
  - Connector for nitrous oxide (N<sub>2</sub>O)
- AGSS testing device with panel for 50 L/min



- AGSS testing device with panel for 25 L/min
- AGSS connection test kit according to DIN EN ISO 7396-2
- Testing device kit with insert
- Optional accessories:
  - O<sub>2</sub> meter for testing gas type
  - Pressure gauge for leakage testing of the pipe line

Test kit terminal unit in line with 7396-1/2 DIN

902.114



## Terminal Unit Forano DIN

CONCEALED / HOLLOW WALL INSTALLATION



### USAGE

The unit is used to withdraw compressed gases and vacuum from a central medical gas supply system in line with DIN EN ISO 7396-1; integration of plugs and medical appliances with plug-in connections in line with DIN 13260-2. The Forano terminal unit complies with the requirements of DIN EN ISO 9170-1.

### ADVANTAGES

- Two-part construction: gas-specific basic block and connector mounting
- Sophisticated design: all-metal actuator with laser labelling, front panel with wavy lines and diaphragm ring
- Easy installation and servicing: cartridge with sealing elements, replacement possible without blocking the station
- Unique marking: gas-type labelling – laser labelling: chemical symbol + German + English, colour coding: neutral or in line with DIN EN ISO 5359.

### TECHNICAL DATA

Inlet: 8 mm copper pipe  
 Operating pressure: 400 kPa to 500 kPa (overpressure) – compressed gases  
 < 60 kPa (absolute pressure) – vacuum

#### FORANO CONCEALED / HOLLOW-WALL – REAR PART (front part has to be ordered separately)

Forano, O2, concealed / hollow wall installation, type DIN / AGA / NF	903.250
Forano, AIR, concealed / hollow wall installation, type DIN / AGA / NF	903.251
Forano, VAC, concealed / hollow wall installation, type DIN / AGA / NF	903.252
Forano, N2O, concealed / hollow wall installation, type DIN / AGA / NF	903.253
Forano, CO2, concealed / hollow wall installation, type DIN / AGA / NF	903.255
Forano, special gas, concealed / hollow wall installation, type DIN / AGA / NF	903.256

#### ACCESSORIES REQUIRED

Front / wave screen to cover the built-in variant UP/HW	903.258
Front / wave screen to cover the built-in variant UP/HW (sales unit = 6 pcs.) UP/HW (sales unit = 6 pcs.)	903.259

All front parts for terminal unit Forano DIN, neutral or DIN EN ISO 5359 colour coding, can be found on page 11 of this product information.

## Terminal Unit Forano DIN

CONCEALED / HOLLOW WALL INSTALLATION

### USAGE

The unit is used to withdraw compressed gases and vacuum from a central medical gas supply system in accordance with DIN EN ISO 7396-1; integration of plugs and medical appliances with plug-in connections in line with DIN 13260-2. The Forano terminal unit complies with the requirements of DIN EN ISO 9170-1.

### ADVANTAGES

- Two-part construction: gas-specific basic block and connector mounting
- Sophisticated design: all-metal actuator with laser labelling, front panel with wavy lines and diaphragm ring
- Easy installation and servicing: cartridge with sealing elements, replacement possible without blocking the station
- Unique marking: gas-type labelling – laser labelling: chemical symbol + German + English, colour coding: neutral or in line with DIN EN ISO 5359.

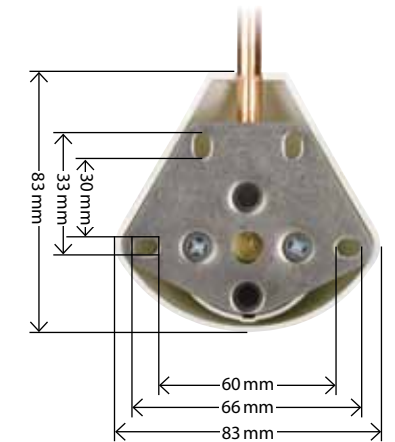
### TECHNICAL DATA

Inlet: 8 mm copper pipe  
 Operating pressure: 400 kPa to 500 kPa (overpressure) – compressed gases  
 < 60 kPa (absolute pressure) – vacuum  
 Depth: 72 mm

#### FORANO SURFACE MOUNTING – REAR PART (front part has to be ordered separately)

Forano, O2, surface mounting, type DIN	903.240
Forano, AIR, surface mounting, type DIN	903.241
Forano, VAC, surface mounting, type DIN	903.242
Forano, N2O, surface mounting, type DIN	903.243
Forano, CO2, surface mounting, type DIN	903.245
Forano, special gas, surface mounting, type DIN	903.246

All front parts for terminal unit Forano DIN, neutral or DIN EN ISO 5359 colour coding, can be found on page 11 of this product information.



## Terminal Unit Forano DIN

INSTALLATION INTO BED HEAD UNIT



### USAGE

The unit is used to withdraw compressed gases and vacuum from a central medical gas supply system in line with DIN EN ISO 7396-1; integration of plugs and medical appliances with plug-in connections in line with DIN 13260-2. The Forano terminal unit complies with the requirements of DIN EN ISO 9170-1.

### ADVANTAGES

- Two-part construction: gas-specific basic block and connector mounting
- Sophisticated design: all-metal actuator with laser labelling, front panel with wavy lines and diaphragm ring
- Easy installation and servicing: cartridge with sealing elements, replacement possible without blocking the station
- Unique marking: gas-type labelling – laser labelling: chemical symbol + German + English, colour coding: neutral or in line with DIN EN ISO 5359.

### TECHNICAL DATA

Inlet: 8 mm copper pipe  
 Operating pressure: 400 kPa to 500 kPa (overpressure) – compressed gases  
 < 60 kPa (absolute pressure) – vacuum

FORANO, PIPE STRAIGHT UP (front part has to be ordered separately)

Forano, O2, bed-head unit pipe straight up, type DIN / AGA / NF	903.200
Forano, AIR, bed-head unit pipe straight up, type DIN / AGA / NF	903.201
Forano, VAC, bed-head unit pipe straight up, type DIN / AGA / NF	903.202
Forano, N2O, bed-head unit pipe straight up, type DIN / AGA / NF	903.203
Forano, CO2, bed-head unit pipe straight up, type DIN / AGA / NF	903.205
Forano, special gas, bed-head unit pipe straight up, type DIN / AGA / NF	903.206

FORANO, PIPE STRAIGHT BACK (front part has to be ordered separately)

Forano, O2, bed-head unit pipe straight up, type DIN / AGA / NF	903.260
Forano, AIR, bed-head unit pipe straight up, type DIN / AGA / NF	903.261
Forano, VAC, bed-head unit pipe straight up, type DIN / AGA / NF	903.262
Forano, N2O, bed-head unit pipe straight up, type DIN / AGA / NF	903.263
Forano, CO2, bed-head unit pipe straight up, type DIN / AGA / NF	903.265
Forano, special gas, bed-head unit pipe straight up, type DIN / AGA / NF	903.266

All front parts for terminal unit Forano DIN, neutral or DIN EN ISO 5359 colour coding, can be found on page 11 of this product information.

## Terminal Unit Forano DIN

INSTALLATION IN CEILING PENDANTS

### USAGE

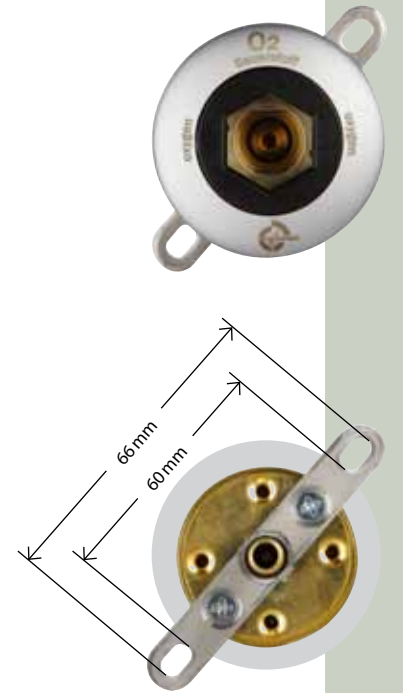
The unit is used to withdraw compressed gases and vacuum from a central medical gas supply system in line with DIN EN ISO 7396-1; integration of plugs and medical appliances with plug-in connections in line with DIN 13260-2. The Forano terminal unit complies with the requirements of DIN EN ISO 9170-1.

### ADVANTAGES

- Two-part construction: gas-specific basic block and connector mounting
- Sophisticated design: all-metal actuator with laser labelling
- Easy installation and servicing: cartridge with sealing elements, replacement possible without blocking the station
- Unique marking: gas-type labelling – laser labelling: chemical symbol + German + English, colour coding: neutral or in line with DIN EN ISO 5359.

### TECHNICAL DATA

Inlet: 6/8 mm barbed hose connector  
 Operating pressure: 400 kPa to 500 kPa (overpressure) – compressed gases  
 < 60 kPa (absolute pressure) – vacuum



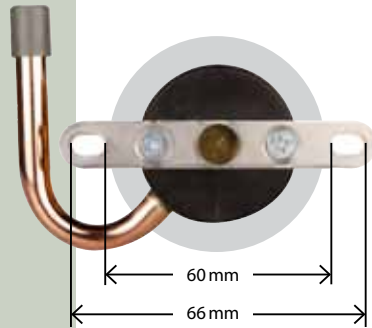
FORANO DIN FOR CEILING PENDANTS DVE (front part has to be ordered separately)

Forano, O2, DVE, type DIN / AGA / NF	903.230
Forano, AIR, DVE, type DIN / AGA / NF	903.231
Forano, VAC, DVE, type DIN / AGA / NF	903.232
Forano, N2O, DVE, type DIN / AGA / NF	903.233
Forano, CO2, DVE, type DIN / AGA / NF	903.235
Forano, special gas, DVE, type DIN	903.236

All front parts for terminal unit Forano DIN, neutral or DIN EN ISO 5359 colour coding, can be found on page 11 of this product information.

## Terminal Unit Forano DIN

INSTALLATION INTO BED HEAD UNIT



### USAGE

The unit is used to withdraw compressed gases and vacuum from a central medical gas supply system in line with DIN EN ISO 7396-1; integration of plugs and medical appliances with plug-in connections in line with DIN 13260-2. The Forano terminal unit complies with the requirements of DIN EN ISO 9170-1.

### ADVANTAGES

- Two-part construction: gas-specific basic block and connector mounting
- Sophisticated design: all-metal actuator with laser labelling
- Easy installation and servicing: cartridge with sealing elements, replacement possible without blocking the station
- Unique marking: gas-type labelling – laser labelling: chemical symbol + German + English, colour coding: neutral or in line with DIN EN ISO 5359.

### TECHNICAL DATA

Inlet: 8 mm copper pipe  
 Operating pressure: 400 kPa to 500 kPa (overpressure) – compressed gases  
 < 60 kPa (absolute pressure) – vacuum



VS 100 M (B)



VS 100 M (A)

#### FORANO DIN BED-HEAD UNIT CONSTRUCTION TRILUX VS 100M (A) RIGHT (front part has to be ordered separately)

Forano, O2, Trilux VS100M (A) type DIN / AGA / NF	903.210
Forano, AIR, Trilux VS100M (A) type DIN / AGA / NF	903.211
Forano, VAC, Trilux VS100M (A) type DIN / AGA / NF	903.212
Forano, N2O, Trilux VS100M (A) type DIN / AGA / NF	903.213
Forano, CO2, Trilux VS100M (A) type DIN / AGA / NF	903.215
Forano, special gas, Trilux VS100M (A) type DIN	903.216

#### FORANO, DIN BED-HEAD UNIT CONSTRUCTION TRILUX VS 100M (B) LEFT (front part has to be ordered separately)

Forano, O2, Trilux VS100M (B) type DIN / AGA / NF	903.220
Forano, AIR, Trilux VS100M (B) type DIN / AGA / NF	903.221
Forano, VAC, Trilux VS100M (B) type DIN / AGA / NF	903.222
Forano, N2O, Trilux VS100M (B) type DIN / AGA / NF	903.223
Forano, CO2, Trilux VS100M (B) type DIN / AGA / NF	903.225
Forano, special gas, Trilux VS100M (B) type DIN	903.226

All front parts for terminal unit Forano DIN, neutral or DIN EN ISO 5359 colour coding, can be found on page 11 of this product information.

## Front Parts Terminal Unit Forano DIN

FOR ALL INSTALLATION TYPES

### FORANO FRONT PART – SCOPE OF DELIVERY

Each gas-specific front part contains the following components:

- Actuator
- Cartridge
- Gas-specific connector mounting
- Warning label (not ready for operation)



### FRONT PART FORANO DIN, NEUTRAL COLOUR CODING (front part has to be ordered separately)

Forano, O2, front part, type DIN – German + English	903.150
Forano, AIR, front part, type DIN – German + English	903.151
Forano, VAC, front part, type DIN – German + English	903.152
Forano, NO2, front part, type DIN – German + English	903.153
Forano, CO2, front part, type DIN – German + English	903.155
Forano, special gas, front part, type DIN – German + English	903.156



### FRONT PART FORANO DIN, ISO32 COLOUR CODING (front part has to be ordered separately)

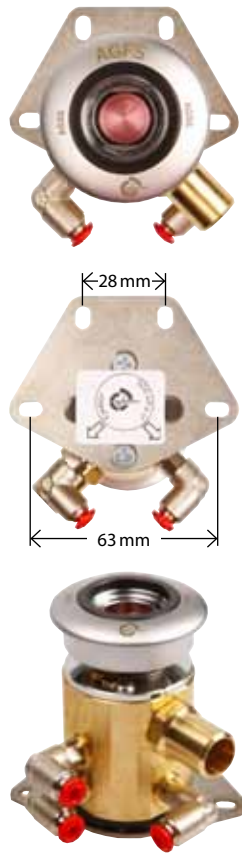
Forano, O2, front part, type DIN – German + English	903.160
Forano, AIR, front part, type DIN – German + English	903.161
Forano, VAC, front part, type DIN – German + English	903.162
Forano, NO2, front part, type DIN – German + English	903.163
Forano, CO2, front part, type DIN – German + English	903.165





## Terminal Unit Forano AGSS

ANAESTHESIA GAS SCAVENGING SYSTEM



### USAGE

System for safe disposal of excess anaesthetic gases and anaesthetic vapours from the clinical environment within a central medical gas supply system in line with DIN EN ISO 7396-2.

All-metal construction, symbols for monitoring operation, with external ejector for vacuum generation. Suction adjustable; single-handed operation when connecting and disconnecting, unlocking via the connector receptacle. Fully mounted in a stainless steel casing, with stainless steel front panel (for concealed or hollow wall installation). Design complies with DIN EN ISO 9170-2.

### TECHNICAL DATA

Dimensions:	145 x 120 x 65 mm (WxHxD)
Material:	Brass; casing and front panel stainless steel
Throughput:	Min. 50 L/min at 500 kPa
Inlet:	Copper pipe 8x1 mm / flexible tube PA 6 mm
Outlet:	Copper pipe 15x1 mm / wave tube 15 mm
Marking:	Colour coding in line with DIN EN ISO 9170-2 standard magenta

### FORANO AGFS

Forano AGSS, concealed/hollow wall	902.073
Forano AGSS, ceiling pendants, with external ejector	902.074
Forano AGSS, bed-head units	902.075
Forano AGSS, surface mounting	902.076



Surface version 130 x 174\* x 80 mm (\*plus approx. 200 mm Cu pipe)



Concealed version 175 x 175 mm



Concealed version 175 x 175 mm



Surface version 130 x 174\* x 80 mm (\*plus approx. 200 mm Cu pipe)

## Terminal Unit Forano Air-motor

FOR DRIVING COMPRESSED AIR-OPERATED TOOLS IN ENCLOSED SPACES

### USAGE

Terminal unit for supplying and disposing of air used to operate surgical tools. A combination of an outlet assembly (for supply) and an inlet assembly (for disposal), which is connected to a supply and disposal system in line with DIN EN ISO 7396-1. A non-return valve in the disposal system prevents return flow of consumed air. Design complies with DIN EN ISO 9170-1. Integration of plugs and medical appliances with plug-in connections in line with DIN 13260-2.

### TECHNICAL DATA

Dimensions:	145 x 120 x 65 mm (WxHxD)
Material:	Brass, chrome-plated; Housing and front plate: stainless steel
Throughput:	Min. 350 L/min at 800 kPa
Inlet:	Copper pipe 8x1 mm / flexible tube PA 6 mm
Outlet:	Copper pipe 15x1 mm / wave tube 15 mm
Marking:	Colour coding in line with DIN EN ISO 9170-1
Operating pressure:	700-1000 kPa



### FORANO AIR-MOTOR

Forano Air-Motor for concealed / hollow wall installation	902.090
Forano Air-Motor for ceiling pendants	902.091
Forano Air-Motor for bed-head units	902.092
Forano Air-Motor for surface mounting	902.093

## Terminal Unit Forano DIN

WALL SUPPLY UNIT

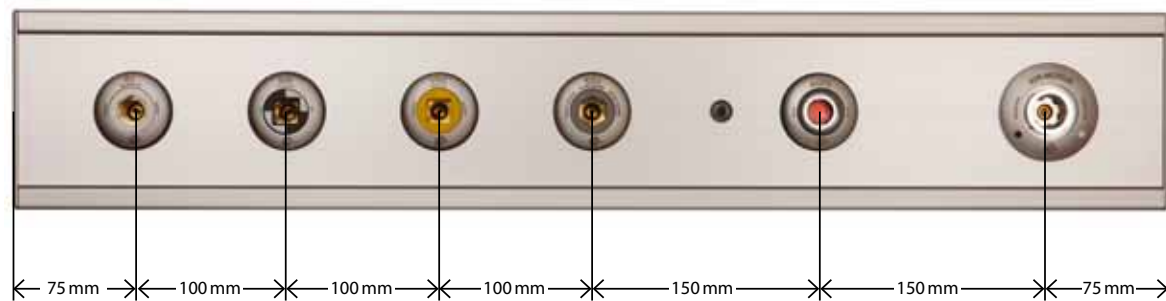
### USAGE

Duct for surface mounting, fully fitted with various terminal units in line with DIN EN ISO 9170-1, Air-Motor and/ or Anaesthetic Gas Scavenging System (AGSS in line with DIN EN ISO 9170-2 with integrated ejector, Air-Motor in line with DIN EN ISO 9170-1) in the aluminium duct.

The length of the duct can be customised to suit requirements. The terminal units are already installed with piping laid. The feed pipe can come from the left, right, above, below or behind.

### TECHNICAL DATA

Inlet:	8x1 mm (1 terminal unit per gas) 12x1 mm (2-3 terminal units per gas)
Outlet:	Forano terminal unit for integration of plugs and medical appliances with plug-in connections in line with DIN 13260-2.
Colour coding:	Neutral or in line with DIN EN ISO 5359



WALL DUCT (Please indicate gas type for each outlet!)

Wall duct Forano, 2 outlets	903.400
Wall duct Forano, 3 outlets	903.401
Wall duct Forano, 4 outlets	903.402
Wall duct Forano, 5 outlets	903.403
Wall duct Forano, each additional outlet	903.404
Wall duct Forano, add-on 1 x AGSS	903.405
Wall duct Forano, add-on 1 x air-motor	903.406
Wall supply unit, meterage	902.040

### TERMINAL UNIT BLOCK

Block of 2 or 3 terminal units in line with DIN EN ISO 9170-1. Integration of plugs and medical appliances with plug-in connections in line with DIN 13260-2. A rail clamp with knurled nut is used to secure the block to a standard equipment rail as per DIN EN ISO 19054 (25 x 10 mm).



The terminal unit blocks can be found in the "Medical Accessories" catalog.

More information can also be found at [www.greggersen.com](http://www.greggersen.com).





## Terminal Unit Forano DIN

INTERNATIONAL STANDARDS AND ADDITIONAL VARIANTS



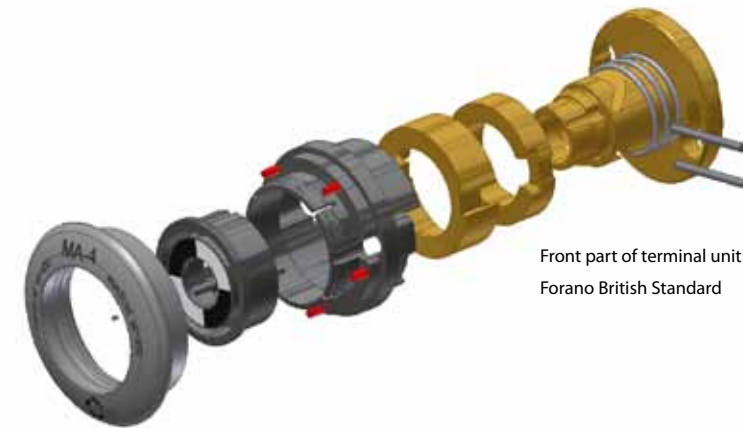
BRITISH STANDARD, SCANDINAVIAN STANDARD (AGA), NORME FRANÇAISE, etc.

The Forano terminal unit system is available in several other international standards beside the DIN variant.

For the British Standard, Norme Francaise and AGA/Scandinavian Standard variants, catalogs are available on our website for download.

For other standards or custom-made designs, please contact us directly about the version you require.

More information can also be found at [www.greggersen.com](http://www.greggersen.com).



Front part of terminal unit  
Forano British Standard



Front part of terminal unit  
Forano Norme Francaise



Front part of terminal unit  
Forano AGA Scandinavian Standard

## Terminal Unit Forano DIN

TOOLS AND ACCESSORIES



### FORANO HEIGHT ADJUSTMENT

In the variant for concealed / hollow wall installation, the basic block is seated in a ring follower. After installation of the housing, the mounting tool can subsequently be used to adjust the mounting depth of the basic block.

Mounting tool for concealed / hollow wall installation – height adjustment 903.300



### FORANO LEAK TEST

For performing the leak test in line with DIN EN ISO 7396-1. The blind flange is screwed to the basic block and closes up the terminal unit. The test pressure can then be used to check the pipe system for leaks.

Blind flange, brass, for Forano pressure test 903.301



### FORANO DISMOUNTING TOOL

Special tool used to remove the actuator without damaging the connector mounting.

Forano actuator dismantling tool 903.302



### FORANO MOUNTING AID

Mounting aid used to place a maximum of 3 or 4 concealed FORANO units next to each other. The mounting aid can be expanded, as required, by being combined with additional mounting aids. The Forano units can be quickly, easily and accurately aligned with each other using this tool. Spacing from Forano centre to Forano centre: 100 mm and 150 mm

Forano mounting aid 903.303

Forano mounting aid add-on for AGSS + Air-Motor 903.306



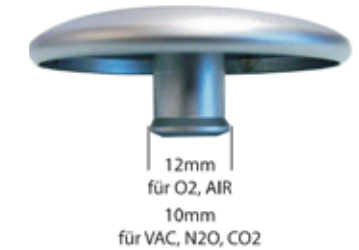
### "OUT OF ORDER" STICKER FOR FORANO DIN

Sticker to paste over the connector mounting when shutting off the terminal unit or sections of the mains supply.

"Out of order" sticker for Forano DIN 903.309

### FORANO CHILD SAFETY LOCK

To secure the FORANO gas terminal units against unauthorised use or for temporary shut-down of a terminal unit, we developed a "child safety lock". This is intended to prevent inadvertent or unauthorized use of the terminal unit.



Forano spanner for child safety lock O<sub>2</sub>, AIR 903.308

Forano child safety lock VAC, N<sub>2</sub>O, CO<sub>2</sub> 903.381

### FORANO SPANNER FOR CHILD SAFETY LOCK

The child safety lock can be removed from the terminal unit using the key.



Forano spanner for child safety lock 903.308

### FORANO DIAPHRAGM RING

The diaphragm ring made of POM is clicked into a 44 mm hole. It is delivered as standard with the Forano wave screen. However, the diaphragm ring can also be obtained as a separate component (e.g. for installation into media supply units).



Forano diaphragm ring 802.842

### FORANO ALLEN KEY

Allen key SW 3 with an additional, removable plastic sleeve. This sleeve guides the key in the front part of the terminal unit, virtually ruling out any "tilting" of the closing cone.



Forano closing cone Allen key 903.305

### FORANO SPANNER FOR SEALING CONE RETAINING SCREW



Forano spanner for sealing cone retaining screw 903.304

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there is no substitute