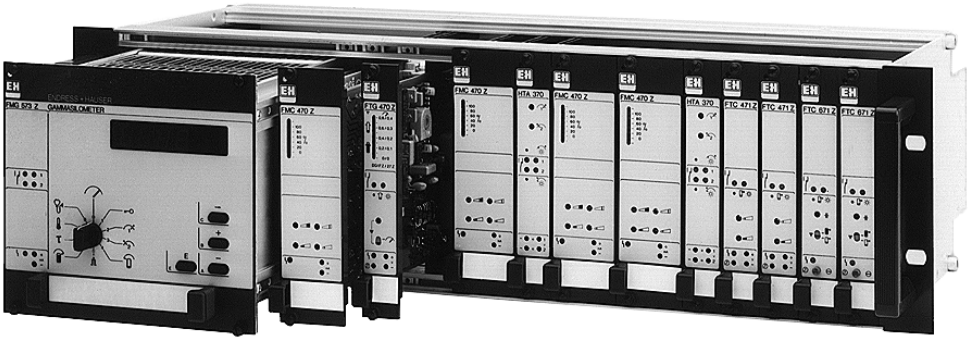
Technical
Information
TI 224F/00/en

System Components
Assembly Racks FXG 1 rackplan

Pre-assembled racks
made to modern safety standards
Planned at the factory with Rackplan



Fully equipped
Racksyst assembly rack

Application

Endress+Hauser offers you an excellent service for planning your instrumentation with the assembly rack FXG 1 for Racksyst plug-in cards and cassettes:

- You tell us how the rack is to be equipped and which wiring system you use
- We deliver the rack fully equipped and wired, together with all relevant documentation

This Technical Information Sheet tells you how your Racksyst assembly rack can be equipped, and which information you must supply when ordering.

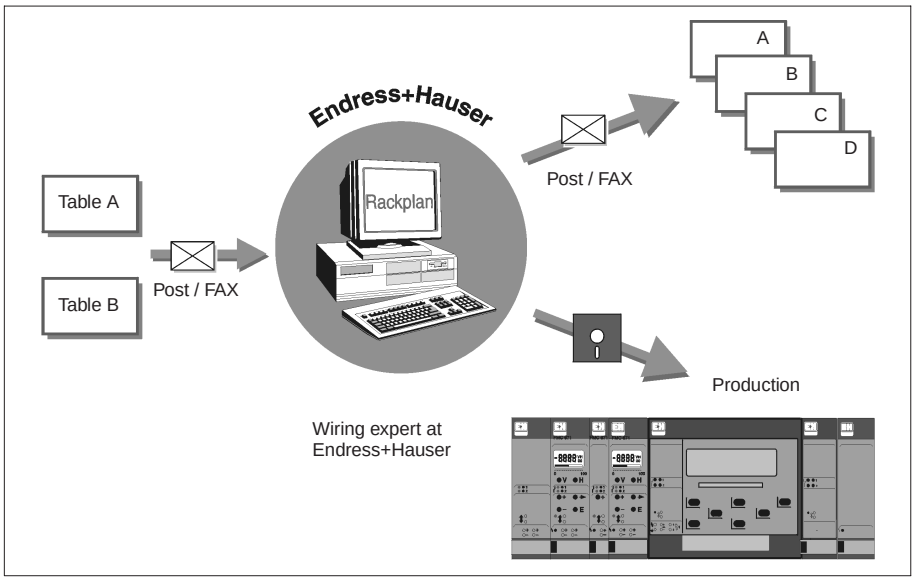
Features and Benefits

- Up to 216 terminals per rack
  – better utilisation of the available card slots
- Only two forms to be filled out
  – simple, transparent and quickly handled
- Plans in DIN A4 format
  – standard forms can be used with modern office equipment, e.g. FAX machines
- Plans drawn up by a wiring expert
  – conformance to regulations assured
  – better quality documentation

Endress+Hauser

The Power of Know How

How Your Rack is Planned



Tables A and B
In order to help you plan an installation incorporating Racksyst racks, plug-in cards and cassettes, we have drawn up assembly and wiring tables. The tables also serve as clear and standardised documentation of your plant.

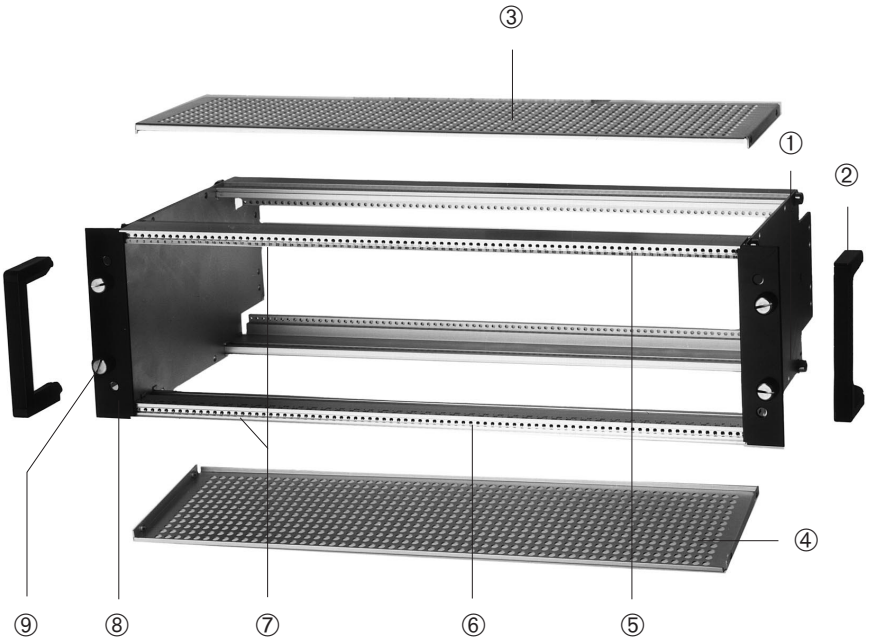
- **Table A** – Racksyst racks, mechanical assembly, type of wiring, cable routing and length
- **Table B** – Plug-in points and instrument arrangement

Please fill out a separate set of forms for each assembly rack. Post or FAX the completed tables to Endress+Hauser,

Dept. MVT, D 79698 Maulburg, Germany.

Tables C and D
A wiring expert at Endress+Hauser uses the information supplied to draw up a wiring diagram with Rackplan, a special program running under AutoCAD.
The racks are designed to conform with EN 50 020 which ensures that circuits leading to hazardous and safe areas are isolated from one another. Terminals are blue for intrinsically safe circuits and grey for others. The rack is supplied with screw terminals. The following documentation is delivered with the finished assembly rack:

- **Table A** – Racksyst racks, mechanical assembly, type of wiring, cable routing and length
- **Table B** – Plug-in points and instrument arrangement
- **Table C** – Individual wiring plan for each plug-in point
- **Table D** – Overall plan of the terminal assignment on the rear of the assembly rack



Racksyst assembly rack

① Assembly rack frame
with side plates
3 HU high, 84 HP wide
② 1 pair of handles
③ Cover plate (upper access panel)
④ Base plate (lower access panel)
⑤ Designation strip
for plug-in points 1...84
⑥ Stick-on labels for designation
of measuring points in the rack
see Table B
⑦ Threaded strips, each with 84 x M2,5
tapped holes
⑧ Endplate cover, black
⑨ Screws M6 x 15

Table A
Racksyst
Assembly Rack

Assembly Rack

The 19" rack is made to standard size in accordance with DIN 41 494, Parts 1 and 5 or IEC 48 D (Sec) 12.
It is intended for use with plug-in cards and cassettes which comply with the standard dimensions for subassemblies stipulated in DIN 41 494, Parts 2 and 4 (depth = 160, height = 100), having male multipoint connectors according to DIN 41 612.

Protection

The rack is not protected against accidental contact with the assembled plug-in unit (IP00). The punched cover and base plates made of anodised aluminium attain a level of protection equivalent to IP20; they also increase mechanical stability, particularly vibration stability.

Basic Assembly

The figure on the opposite page shows an exploded view of the rack assembly. Item 1 is the basic frame with side pieces comprising:

- 2 threaded strips with tapped holes for each plug-in point
- 1 designation strip for plug-in points, numbered from 1 to 84
- 2 black cover plates for front angle plate
- 4 slotted screws for mounting the rack in a frame or cabinet.

1 Baugruppenträger mit / Assembly rack with / Rack 19" avec

- ein Paar Griffen / a pair of handles / une paire de poignées ☐
- Deckblech / Cover plate / tôle de protection (haut) ☐
- Bodenblech / Base plate / tôle de protection (bas) ☐
- Bestellcode / order code / référence: ☐

_____

2 Verdrahtung der Steckplätze auf / Wiring at / Câblage sur

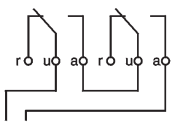
- ohne Verdrahtung / no wiring / non câblé ☐
- Schraubklemmen / screw types / bornes ☐
- Kabelschwanz / cable tree / toron ☐
- Kabel herausgeführt von hinten gesehen: / With cable tree, seen from rear: / Sortie toron (vue arrière du RACK): L G ☐ R D ☐
- Kabellänge / length of cable / longuer de cable _____ m

3 Verdrahtungsanschluß / Connexion type / Connexion

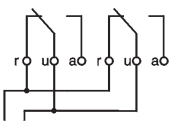
- Wire - wrap ☐
- Löt / soldering / à souder ☐
- Midi ☐
- Maxi ☐

*) Verdrahtung nur in wire-wrap / wiring only in wire-wrap / câblage seulement à wrapper

4 Serienschaltung / On serie / Raccordement en série A ☐



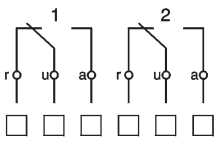
5 Parallelschaltung / On parallel / Raccordement en paralelle A ☐



6 Stromausgang 0/4 - 20 mA / Current output / Sortie courant ☐

Spannungsausgang 0/2 - 10 V / Voltage output / Sortie tension ☐

7 Relaisausgänge / Relay output / Sorties relais T ☐



8 Andere Verdrahtungsarten bitte einzeichnen / Please sketch other wiring / Autre mode de câblage (à préciser)

A ☐ T ☐

9 E+H Rackbus ☐

10 19" Kassettengeräte - Cassette

21 - 28 TE Geräte Spannungsver. AC ☐
21 - 28 HP Power supply of device
21 - 28 TE Tension d' alimentation DC ☐

11 Besteller / orderer / client

Adresse: _____
Address: _____
Adresse: _____
Zust./comp.: _____
Tel.: _____
Fax: _____

12 Montage-Adresse / site / livraison

Adresse: _____
Address: _____
Adresse: _____
Zust./comp.: _____

13 Bemerkungen / remarks - remarques

_____
_____
_____
_____

A = Alarm (Störmeldung) / alarm (failure) / Alarme (signalisation défaut)
T = Grenzkontakt (Relais) testing / contact de seuils

14 Dokument / document
Genehmigt:
Agreed:
Approuvé: Unterschrift / signature

Table - A

Teilenr. / part no. / numéro de réf. 016507-0000

Gez. Gepr.		
Name	Datum	
Maßstab	1:1	

E+H Kom.-Nr.:	Pos.

Endress+Hauser
GmbH+Co.
Hauptstraße 1
D - 79689 Maulburg
Tel. 07622 - 28-1264
Fax 07622 - 28-1951

Table B
Plug-In Points

Assembly Rack
The assembly rack will be supplied to your specifications complete with subassembly fittings (guide rails, female connectors, isolating caps, etc.), Racksyst instruments and filler plates.

Instrument Arrangement
The Racksyst assembly rack has 84 plug-in points; these are numbered from 1 to 84, starting at the left (seen from the front).

Enter which instrument is to occupy which plug-in point in Table B, Section »a«. Sketch in the width of each instrument in horizontal pitch units (HP).
The widths can be taken from the table on page 7 or the corresponding technical information sheets.

The plug-in point number is the last number to the left which is still within the limits of the unit. When filling out Table B, observe notes 1…5 below.

Note 1: Power supply
The power supply unit must be placed to the right of the rack at position 78. To allow heat to be dissipated and to satisfy conditions for intrinsic safety, leave a gap of 1 HP between the power supply and any intrinsically safe Endress+Hauser instrument.

Note 2: Intrinsic Safety
Instruments with sensors operating in explosion hazardous areas must be fitted on the left-hand side and the remaining instruments on the right-hand side of the rack, thus separating intrinsically safe circuits from other circuits.

Note 3: Endress+Hauser Instruments
Racksyst plug-in cards and cassettes can be fitted directly adjacent to each other, irrespective of whether the signal inputs of some cards lead back into hazardous areas. Exception:
power supply unit NT 471, see Note 1.

Note 4: Other Instruments
For other makes of instrument a minimum clearance of 2 HP must be allowed; the dead space should be covered with blind plates.
The instruments are arranged as shown to the left. Please note the minimum gaps.

- If you order a plug-in point for a non-intrinsically safe instrument of another make we will incorporate a fully fitted female multipoint connector according to DIN 41 612 without isolating caps.
  Send us a dimensioned drawing showing the construction of the female multipoint connector, its position and the position of the guide rails, or alternatively the instrument itself.
- For intrinsically safe instruments, the female multipoint connector to DIN 41 612 must be supplied (if wiring is required in wire-wrap 1x1). In addition, enclose all PTB certificates and a list of the measuring point designations for all instruments and plug-in points.

Note 5: Notes on Table B
Fill in Table B carefully — an example is on page 6.

Section a:
In addition to the width and type designation of the Racksyst instruments please indicate the order number (see price list). In the case of cassette units, indicate the supply voltage you desire. Write “reserve” in the appropriate box where a space is to be reserved for an instrument not yet designated.

Section b:
Enter the type designation of the sensor which is to be connected to the instrument specified in Section “a”.

Section c:
Indicate with a cross in the appropriate box if you want the rack supplied with the instrument ready fitted or if the instrument is to be supplied separately at a later date, also if the space is to be kept open or to be closed with a blind plate.

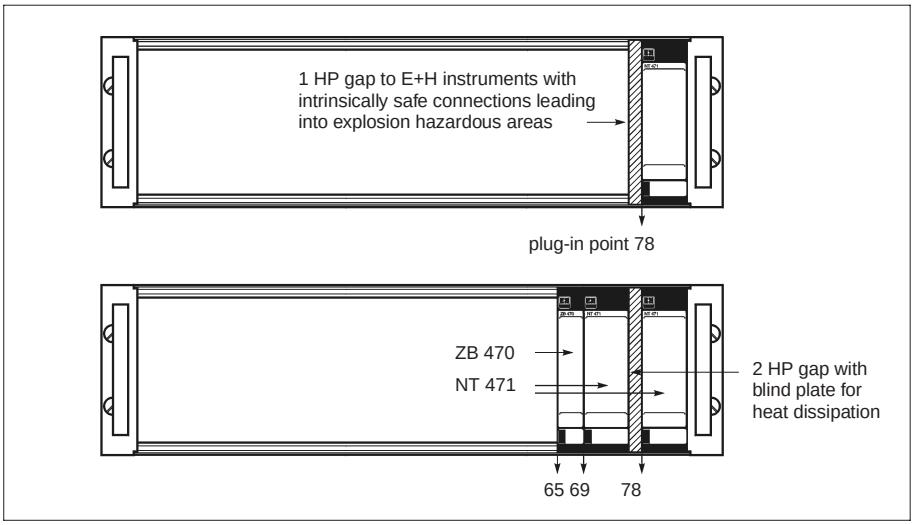
Section d:
Indicate whether the sensor or probe is to be used in an explosion hazardous area and whether it is to be connected to an intrinsically safe Racksyst instrument or not. (The information must be entered for reserve areas also)

Section e:
If you want the designation strips for the measuring points on the rack and/or on the Racksyst measuring instruments to be completed by Endress+Hauser, give details of the desired designations in Sections e and f. Please note the original size of the spaces for labelling and the maximum number of characters and lines (see Figure on page 6).

Position of power supply unit in rack

above:
with one supply unit and no monitor

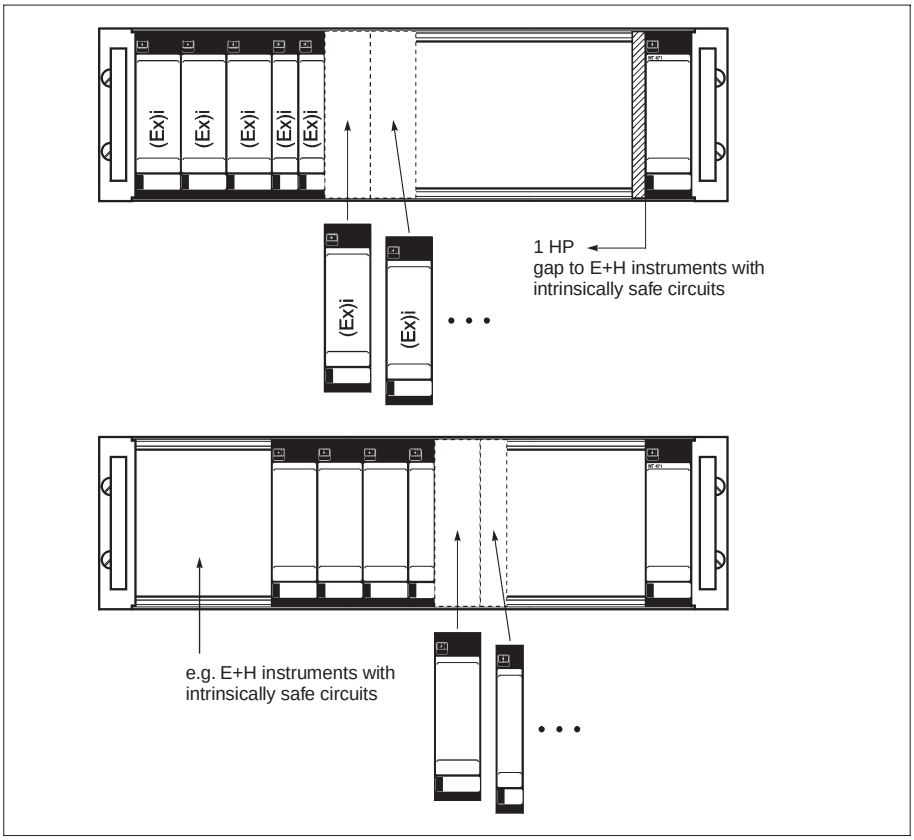
below:
with two supply units and monitor



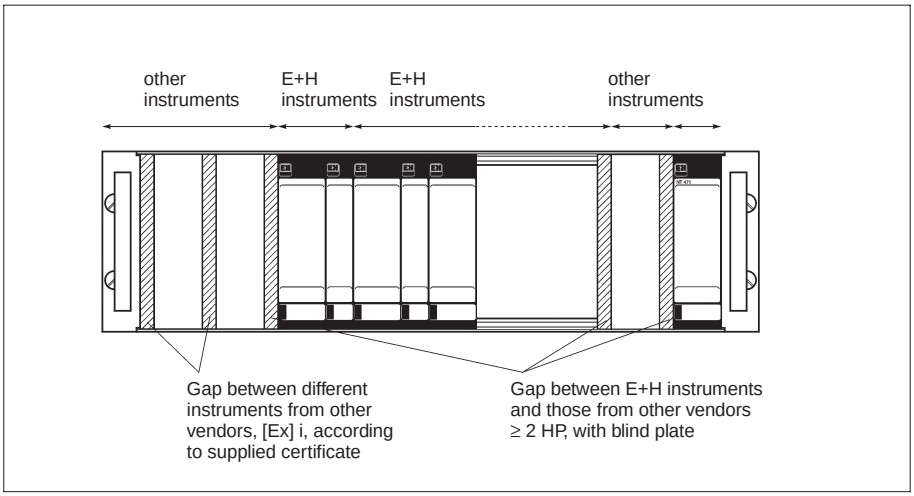
Arrangement of Endress+Hauser instruments

above:
E+H instruments with intrinsically safe circuits

below:
E+H instruments without intrinsically safe circuits

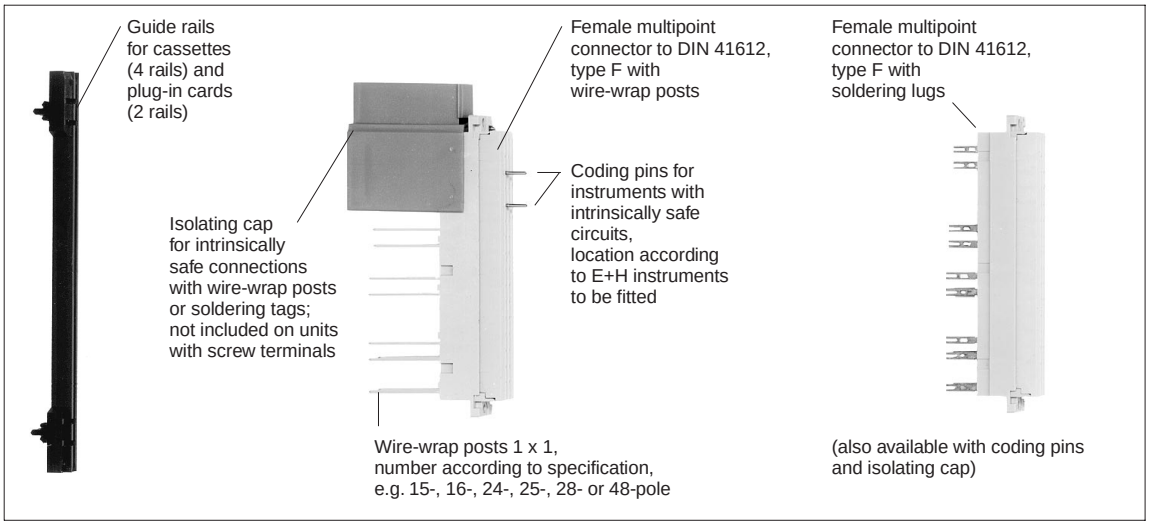


Instruments from other vendors

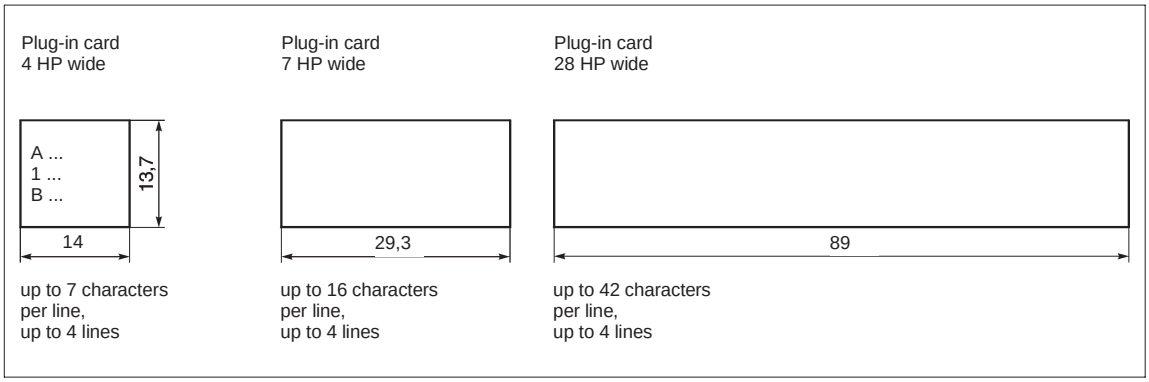


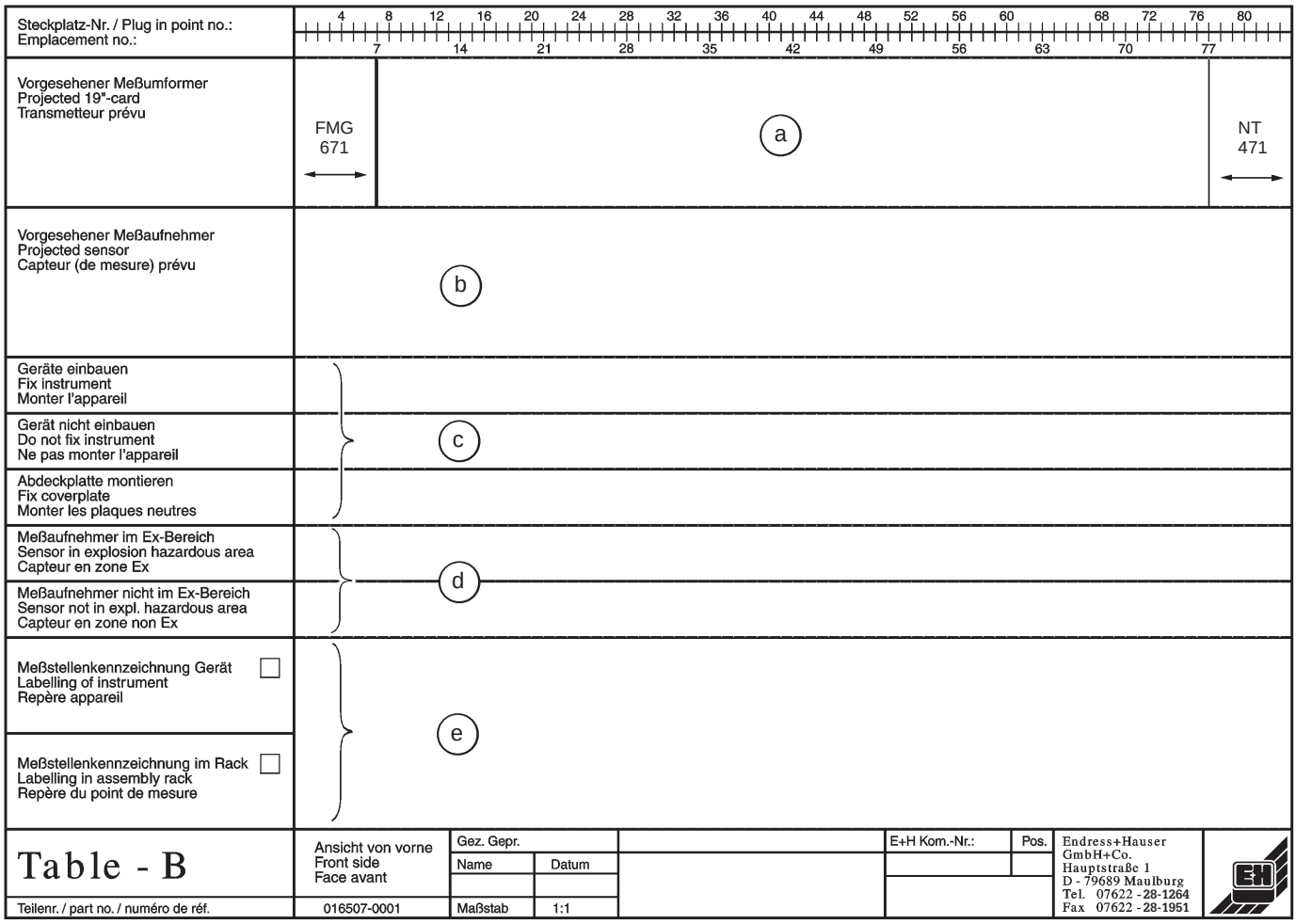
Accessories
for plug-in points:

Guide rails,
Female multipoint
connectors,
Isolating caps for
intrinsically safe wiring,
Coding pins



Measuring point
labelling fields on
Endress+Hauser
Racksyst cards,
cassettes and
assembly racks





Racksyst
Plug-In Cards

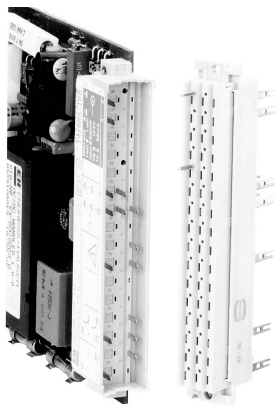
List of Racksyst plug-in cards with width, plug-in point kit, and position of coding pins for applications in hazardous areas

rel : relay output
tr : transistor output

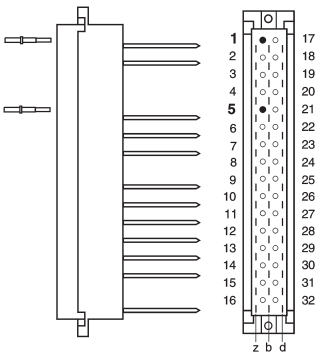
Instrument	**Width**	**Kit**	Coding pins
AMT 571/572	7 HP	28/2	
AZT 570	7 HP	28/2	
FMA 670	7 HP	48/2	
FMB 672/677	7 HP	28/2	1,24
FMC 671/676 Z	7 HP	28/2	1,22
FMC 672/677 Z	7 HP	28/2	1,23
FMG 573 Z	28 HP	28/4	1,3
FMG 671	7 HP	25/2	2,8
FMU 671/676	7 HP	30/2	
FMU 673/678 Z	7 HP	30/2	1,28
FMX 570	7 HP	28/2	2,9
FMX 770	7 HP	25/2	2,1
FTA 670	7 HP	48/2	
FTC 470/471 Z	4 HP	15/2	1,6 rel
			1,13 tr
FTG 470 Z	4 HP	15/2	1,2
			1,10
FTG 671	7 HP	25/2	2,7
FTL 370	4 HP	16/2	2,5
FTL 372	4 HP	16/2	2,6
FTL 375 P-###1	4 HP	24/2	2, 14
FTL 375 P-###2	4 HP	24/2	2, 17
FTL 375 P-###3	4 HP	24/2	2, 18
FTL 375 N-###1	4 HP	24/2	2, 19
FTL 375 N-###2	4 HP	24/2	2, 20
FTL 375 N-###3	4 HP	24/2	2, 21

Instrument	**Width**	Kit	**Coding pins**
FTL 670	4 HP	25/2	2,11
FTR 471	4 HP	28/2	
FTW 470/570 Z	4 HP	30/2	1,19 rel
			1,20 tr
FXA 675	4 HP	25/2	
FXN 672	4 HP	25/2	
HTA 470 Z	4 HP	28/2	1,9 rel
			1,17 tr
HAD 575	7 HP	48/2	
NT 471	7 HP	28/2	
ZA 370	7 HP	48/2	
ZA 371	7 HP	48/2	
ZA 373	7 HP	48/2	
ZA 375	7 HP	28/2	
ZA 377	7 HP	25/2	
ZA 672	7 HP	28/2	
ZA 673	7 HP	28/2	
ZA 674	7 HP	28/2	
ZB 470	4 HP	28/2	
ZL 6370	28 HP	3x48/2	

Layout of coding pin sockets on multipoint connector (example FMC 470 Z)



Numbering of pins on multipoint connector



For coding pin position refer to table above or Technical Information sheet

Table C
Wiring

Endress+Hauser will wire up the Racksyst rack for you, using the wire-wrap technique when flat plugs or screw terminals are planned for external leads

A DIN A4 planning sheet (Table C) for each individual instrument is provided by Endress+Hauser to help you plan and check wiring. The plan is drawn up using the Rackplan software which has been specially written for this purpose. Rackplan is an extension module for AutoCAD.

An example of Table C is shown below.

Wiring plans are drawn up with the help of the RACKPLAN software

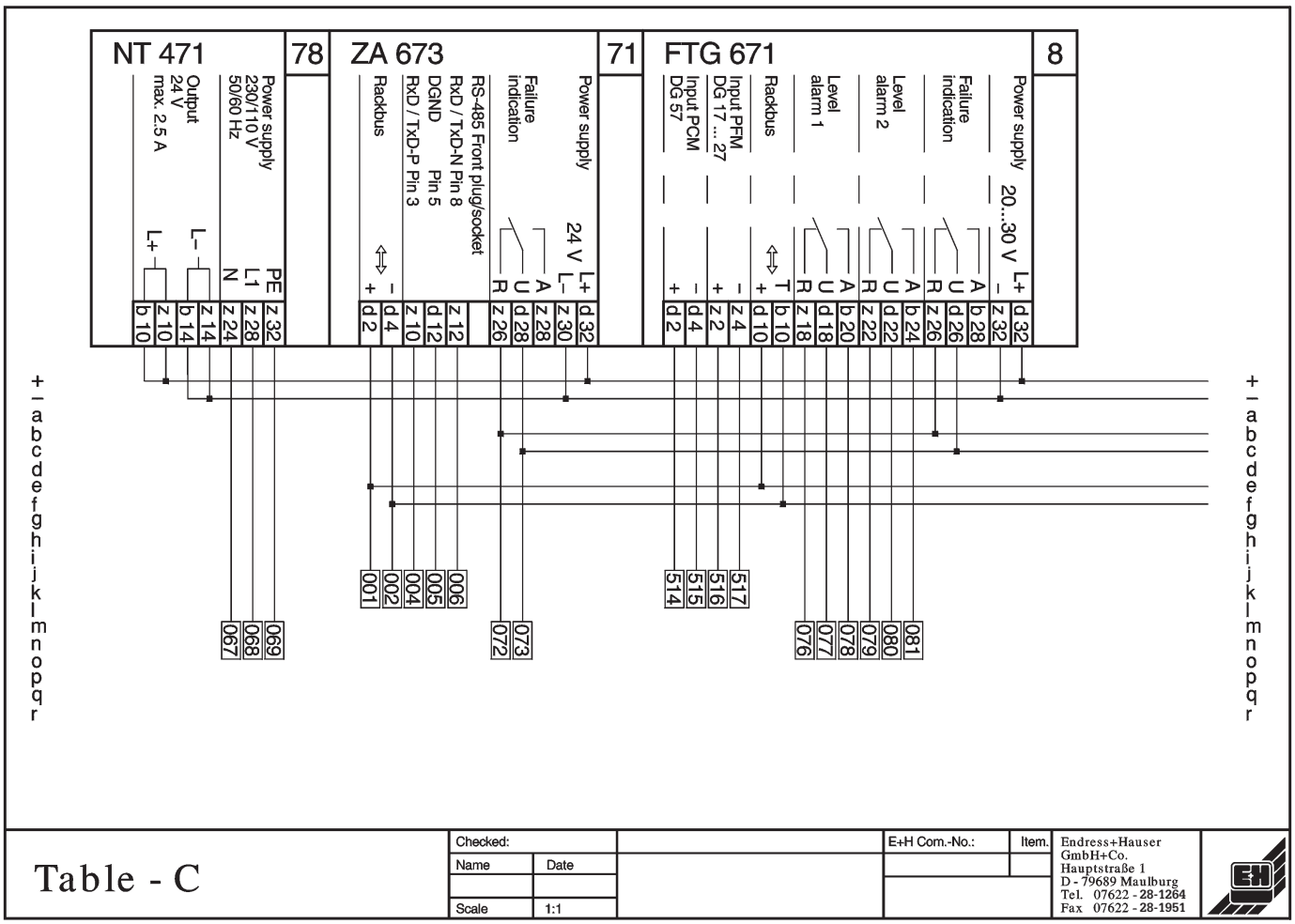


Table - C	Checked:			E+H Com.-No.:	Item.	Endress+Hauser GmbH+Co. Hauptstraße 1 D - 79689 Maulburg Tel. 07622 - 28-1264 Fax 07622 - 28-1951
	Name	Date				
	Scale	1:1				

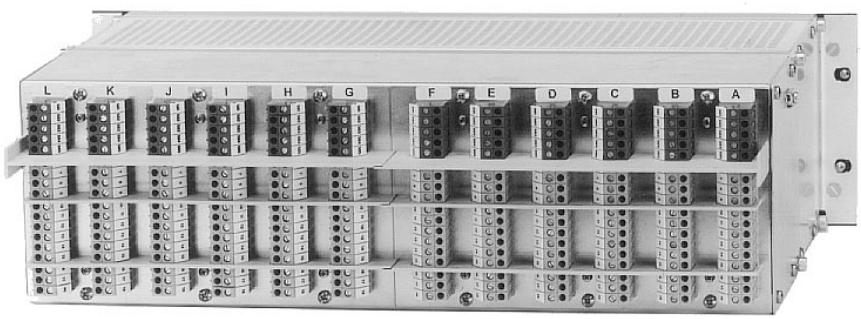
Table D
Screw Terminals

Terminal Assignment
The Racksyst assembly rack is supplied with screw terminals to facilitate connection to other components. The terminals are fitted at the rear of the rack.

The screw terminals are mounted in 12 vertical blocks of 18 terminals. Three horizontal strips separate the sensor terminals from the communication terminals as well as the analogue output/relay and power terminals. A total of 216 screw terminals are available.

Table D shows the terminal assignment and indicates the connections leading to hazardous and safe areas.

Checks
Prior to dispatch, the rack, complete with components and wiring, will be checked by Endress+Hauser and compared to the Tables you provided. A set of copies will be enclosed with the rack on delivery.



Rear few of equipped assembly rack

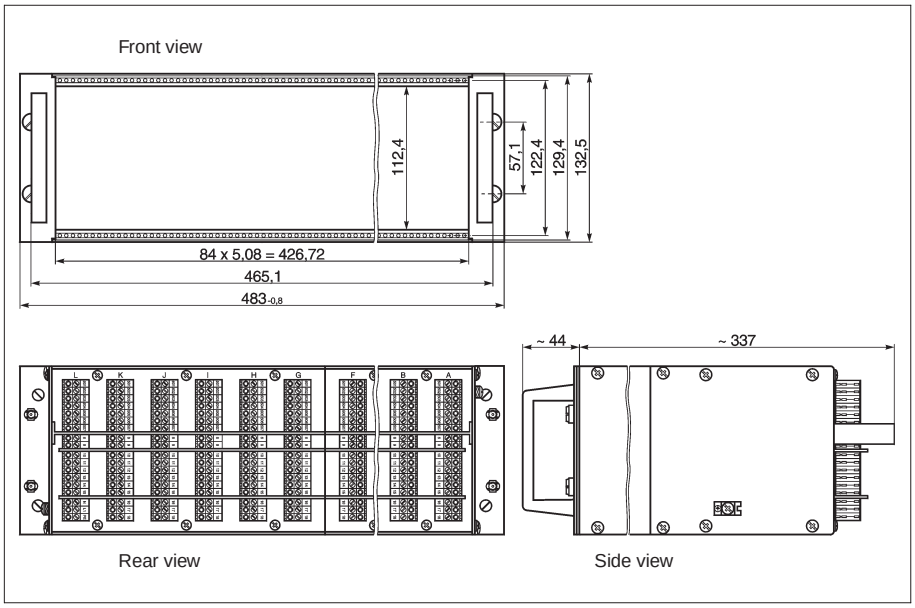
Ex-Verdrahtung	Ja ☐	Nein ☐	Rack von hinten gesehen
Wiring for Ex-area	Yes	No	Rear view of assembly rack
Câblage pour Zone Ex	Oui	Non	Rack vue arrière

L	K	J	I	H	G
					501
					502
					503
					504
					505
					006
					007
					008
					009
					010
					011
					012
					013
					014
					015
016					016
017					017
018					018
cover plate	cover plate	cover plate	cover plate	cover plate	

F	E	D	C	B	A
501	501	501	501	501	501
502	502	502	502	502	502
503	503	503	503	503	503
504	504	504	504	504	504
505	505	505	505	505	505
006	006	006	006	006	006
007	007	007	007	007	007
008	008	008	008	008	008
009	009	009	009	009	009
010	010	010	010	010	010
011	011	011	011	011	011
012	012	012	012	012	012
013	013	013	013	013	013
014	014	014	014	014	014
015	015	015	015	015	015
016	016	016	016	016	016
017	017	017	017	017	017
018	018	018	018	018	018

Table - D	Checked		File name: TAB-DII2	E+H Com. No.:	Item	Endress+Hauser GmbH+Co. Hauptstraße 1 D - 79689 Maulburg Tel. 07622 - 28-1264 Fax 07622 - 28-1951
	Name	Date	Rack No.:			
			KD Order No.:	Page		
	Scale	1:1	Plant:			

Technical Data



Dimensions in mm
of the Racksyst
assembly rack
1" = 25.4 mm

Mechanical Construction

- Type:
  19" Racksyst assembly rack,
  height 3 VP, width 84 HP
- Material:
  anodised aluminium
- Ingress protection (EN 60 529):
  IP20
- Weight:
  fully equipped ca. 9 kg

Environment (Rack Equipped)

- Operating temperature: 0°C…+40°C
  Limiting temperature: –10°C…+50°C
  Storage temperature: –40°C…+70°C
  (°F = 1.8 x °C + 32)
- Climatic class (EN 60 721, Part 3):
  KSE, depending upon equipment
- Vibration resistance:
  f = 2.0 Hz to 13.2 Hz: a ± 1 mm
  f = 13.2 Hz to 100 Hz: 0.7 g

Plug-in Point Installation Kit

Depending upon order xx/y
xx = Number of contacts
y = Number of guide rails

e.g. 28/2 = 28 contacts and
two guide rails

Product Structure

Racksyst Assembly Rack 84 HP

Number

Certificate
R Standard
Y Other

Basic Equipment (Table A)
A With bottom cover
B With top cover
C With bottom and top cover
D With handles
E With handles and bottom cover
F With handles and top cover
G With handles, bottom and top cover
H Without handles, top and bottom cover
Y Other

Wiring of Rack
1 Screw terminals for 1... 7 instruments
2 Screw terminals for 8...14 instruments
3 Screw terminals for 15...21 instruments
7 No wiring of the rack
Y Other

☐ **Installation Kit 15/2; 16/2**
A x pieces, installation kit 15/2; 16/2
Z Without installation kit 15/2; 16/2
Y Other

☐ **Installation Kit 28/2; 25/2; 24/2**
A x pieces, installation kit 28/2; 25/2; 24/2
Z Without installation kit 28/2; 25/2; 24/2
Y Other

☐ **Installation Kit 30/2; 27/2**
A x pieces, installation kit 30/2; 27/2
Z Without installation kit 30/2; 27/2
Y Other

☐ **Installation Kit 48/2**
A x pieces, installation kit 48/2
Z Without installation kit 48/2
Y Other

☐ **Installation Kit 28/4**
A x pieces, installation kit 28/4
Z Without installation kit 28/4
Y Other

☐ **Installation Kit 48/4**
A x pieces, installation kit 48/4
Z Without installation kit 48/4
Y Other

Connection Type (Table A)
1 Wire-wrap connection
2 Soldering lugs
3 Midi-termipoint connection
4 Maxi-termipoint connection
7 Without connections (if no installation kit)
9 Other

☐ **Cover Plate 1 HP wide (Table B)**
A x pieces
Z Without cover plate 1 HP wide
Y Other

☐ **Cover Plate 4 HP wide (Table B)**
B x pieces
Z Without cover plate 4 HP wide
Y Other

☐ **Cover Plate 7 HP wide (Table B)**
C x pieces
Z Without cover plate 7 HP wide
Y Other

FXG 1– ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ Product designation

Field housing

Supplementary Documentation

- ☐ Racksyst
  System Information
  SI 008/00/en

- ☐ Racksyst Field Housing
  Planning Hints
  Technical Information
  TI 907/00/en
- ☐ Racksyst Field Housing
  Technical Information
  TI 026/00/en

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D-79574 Weil am Rhein
Germany

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Endress+Hauser
The Power of Know How

08.99/MTM

TI 224F/00/en/09.01
EHF/CV5