

Rexroth Connection System Assembly and Tools for Diax 04 and EcoDrive 03

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Edition 01

Mounting guidelines



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- What is the purpose of this document?** This documentation ...
 - Helps familiarize the user with Indramat connectors and the mounting tools needed to make them.

Course of modifications

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1 Introduction

1.1 Indramat Internal Connection System

In addition to such components as controls, drive controllers and motors, Indramat also offers the accompanying internal connection system which makes Indramat single-source supplier of digital drive systems.

Great importance was attached to the following features and characteristics when constructing plugs and cables:

- Resistance to lubricants and emulsions used to cut materials or when drilling
- Maintaining EMC directives
- Protection categories up to IP67
- Vibration shock demands
- Easy handling and assembly
- Fatigue strength under reversed bending stresses
- Halogen free
- Burn behavior meets demands of VDE 0472, section 804

All these features ensure operation with the least amount of interference even under the most adverse ambient conditions.

Constant quality control The plug-in connectors and cables are developed and manufactured explicitly for Indramat. The components are constantly subject to quality control processes. Our many years of experience as a supplier of machine tools is of great advantage in this case.

1.2 About the Contents of this Document

This document describes the tools and processes that the making of motor power and feedback cables requires.

The description of all the tools need to either assemble or take individual connector types apart are outlined in the relevant documentation.

The following table offers an overview of the connectors which Indramat uses.

Connector series	Connector types of series
connector size 1	INS0680; INS0681; INS0682; INS0683; INS0685
connector size II	INS0480; INS0481; INS0482; INS0483; INS0484; INS0486
connector size III	INS0380; INS0381; INS0382; INS0383; INS0384; INS0386

Fig. 1-1: Overview of power plug-in connectors

This table lists which power plug-in connector or flange socket is allocated to which connector series (connector size). To simplify the assembly instructions, the assembly tools are also allocated to the connector size.

Note: The power connectors of series II and III require conduit threads. Any necessary reduction is not part of the delivery. The conduit thread sizes and the reduction should be selected in terms of the external cable diameters and the conduit threads of the end housing.

Additional information Information from other Indramat documents may be needed to assemble connecting cables.

Motor power cables The following information is needed to assemble motor power cables:

- Connector types,
- Power strand cross sections and
- Connection and assignment diagrams.

Motor feedback cables The following information is needed to assemble motor feedback cables:

- Connector types and
- Connection and assignment diagrams.

This information cannot be specified in this document. For details see the motor document (Project Planning Manual).

Assembly Instructions

The assembly instructions generally describe the procedures for cables with a complete shield. The steps are more or less the same when assembling power cables without a shield. Only those steps concerning the shield are not reiterated.

1.3 Indramat Cables - Technical Data

Motor power cable with shield

Name	Unit	INK Data																			
		0653	0650	0602	0603	0604	0605	0606	0607	0667	0668										
Type designation of cable (non-assembled)																					
Power or power strands cross section	mm ²	4x 1.0	4x 1.5	4x 2.5	4x 4.0	4x 6.0	4x 10.0	4x 16.0	4x 25.0	4x 35.0	4x 35.0										
Control strands cross section (holding brake, temperature monitoring or control voltage)	mm ²	2 x (2 x 0.75)	2 x (2 x 0.75)	2 x (2 x 1.0)	(2 x 1.0) + (2 x 1.5)	(2 x 1.0) + (2 x 1.5)	(2 x 1.0) + (2 x 1.5)	2 x (2 x 1.5)	2 x (2 x 1.5)	2 x (2 x 1.5)	2 x (2 x 2.5)										
Diameter	mm	12.0 ±0.5	12.2 ±0.5	15.0 ±0.8	17.8 ±0.6	18.6 ±0.8	22.5 ±1.0	27.6 ±0.8	30.4 ±0.8	32.4 ±0.8	38.4 ±0.8										
min. bend radius permanently routed	mm	75	85	95	100	140	170	190	210	230	260										
flexibly routed	mm	120	140	160	180	190	230	280	300	320	370										
Number of bends [in Mio.]		2	2	2	2	2	2	2	2	2	2										
Specific cable weight	kg/m	0.22	0.24	0.33	0.49	0.59	0.87	1.31	1.72	2.16	3.10										
Construction		Lay out for constant bending demands																			
Burn behavior		Meets demands as specified in VDE0472 Section 804																			
Chemical features		Resistant to mineral oils and greases, hydrolysis resistant, silicone and halogen free																			
Approbation		UL and CSA listed																			
Allowed ambient temp. for storage	°C	-30 to +80																			
Continuous operating temp. for	°C																				
fixed routing												-30 to +90									
flexible routing												-30 to +80									
External cable mantle -material -color		Surface is dull with poor adhesion; PUR orange																			

Fig. 1-2: Technical data - Motor power cable with shield

Feedback cable

Name	Unit	INK Data													
		0208	0209	0448	0280	0325	0532								
Type designation of cable (non-assembled)															
Power strands cross section	mm ²	---	2x 1.0	2x 0.5	2x 1.0	---	4x 1.0								
Control strands cross section (holding brake), temperature monitoring or control voltage)	mm ²	9 x 0.5	4 x (2 x 0.25)	4 x (2 x 0.25)	3 x (2 x 0.25) + 3 x 0.25	3 x (2 x 0.25)	4 x (2 x 0.14) + 4 x 0.14								
Diameter	mm	8.8 ±0.3	8.8 ±0.3	8.8 ±0.3	10.0 ±0.3	8.7 ±0.3	9.7 ±0.3								
min. bend radius permanently routed	mm	45	45	45	50	60	60								
flexibly routed	mm	90	90	90	100	90	100								
Specific cable weight	kg/m	0.12	0.12	0.11	0.23	0.11	0.15								
Number of bends [in Mio]		2	2	2	2	2	2								
Construction		Lay out for constant bending demands													
Burn behavior		Meets demands as specified in VDE0472 Section 804													
Chemical features		Resistant to mineral oils and greases, hydrolysis resistant, silicone and halogen free													
Approbation		UL and CSA listed													
Allowed ambient temp. for storage	°C	-30 to +80													
Continuous operating temp. for fixed routing	°C	-30 to +90													
flexible routing		-30 to +80													
External cable mantle -material -color		Surface is dull with poor adhesion; PUR orange													

Fig. 1-3: Technical data - Feedback cable

1.4 Load - Motor power cable

i INDRAMAT motor power cables comply with VDE 0298 section 4 (1995) and the standards for European countries EN 60204-1 (1993). The specified current load is valid for installation types B2. Due to the temperature correction factor applicable to INDRAMAT cables, the current load is higher than specified in EN 60204-1 (1993). The use of cables from other manufacturers or with other types of installation may mean that bigger cable cross sections are needed and other load limits apply.

Note: If other standards apply for a specific use or if the cables are routed differently, then other cable cross sections may be required.

Note: The machine or installation manufacturer is responsible for cable cross sections.

The following table lists current loads for INDRAMAT and standard PVC cables as dependent on the type of installation at an ambient temperature of +40°C.

Cross section in mm ²	Current load as per VDE 0298 Section 4 for INDRAMAT cables in A	Current load as per EN 60204 for standard PVC cables in A			
	Type of installation B2	Type of installation B1	Type of installation B2	Type of installation C	Type of installation E
1.0	13.0	10.4	9.6	11.7	11.5
1.5	15.7	13.5	12.2	15.2	16.1
2.5	22.6	18.3	16.5	21	22
4	29.6	25	23	28	30
6	38.3	32	29	36	37
10	53.0	44	40	50	52
16	71.3	60	53	66	70
25	93.9	77	67	84	88
35	117.4	97	83	104	114
50	146.1	---	---	123	123

Fig. 1-4: Current load

Current load depends on installation type of the leads. The following illustrates installation modes as per (see Fig. 1-5) EN 60204-1 (1993).

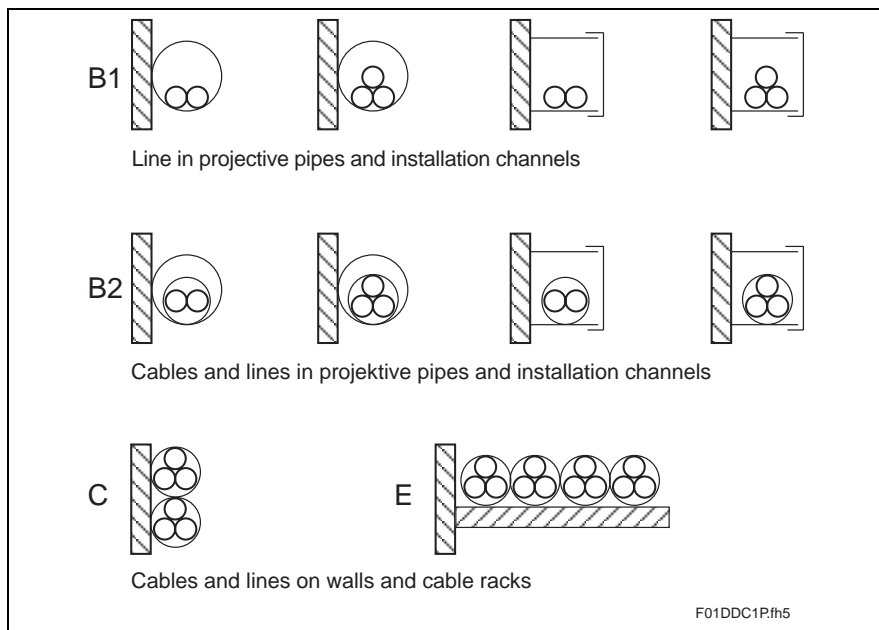


Fig. 1-5: Installation types as per EN 60204

Note: If types of installation other than „B2“ as per EN 60204-1 (1993) are used, then bigger cable cross sections may be needed!

2 Power Plug-in connectors

2.1 Connector size 1 (INS0680, INS0681, INS0682, INS0683, INS0685)

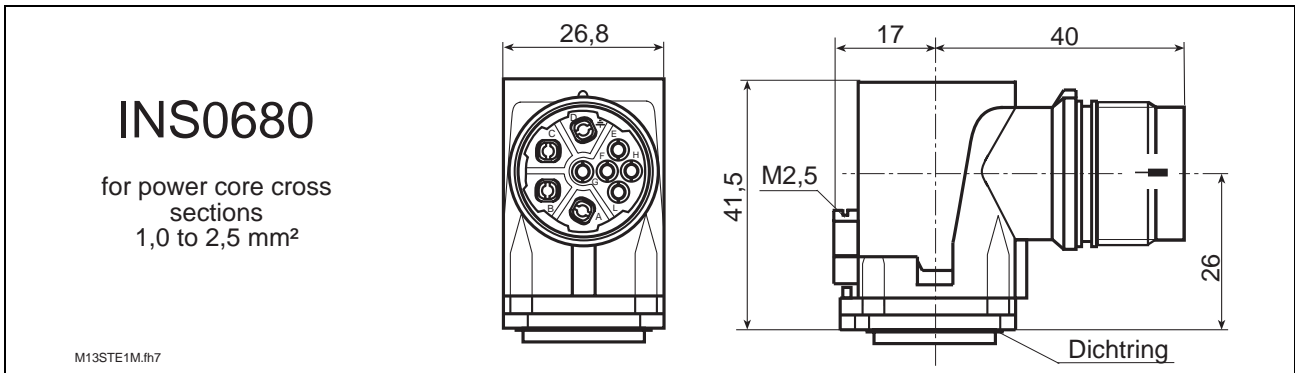


Fig. 2-1: INS0680 Rotating angle - flanged socket with pins

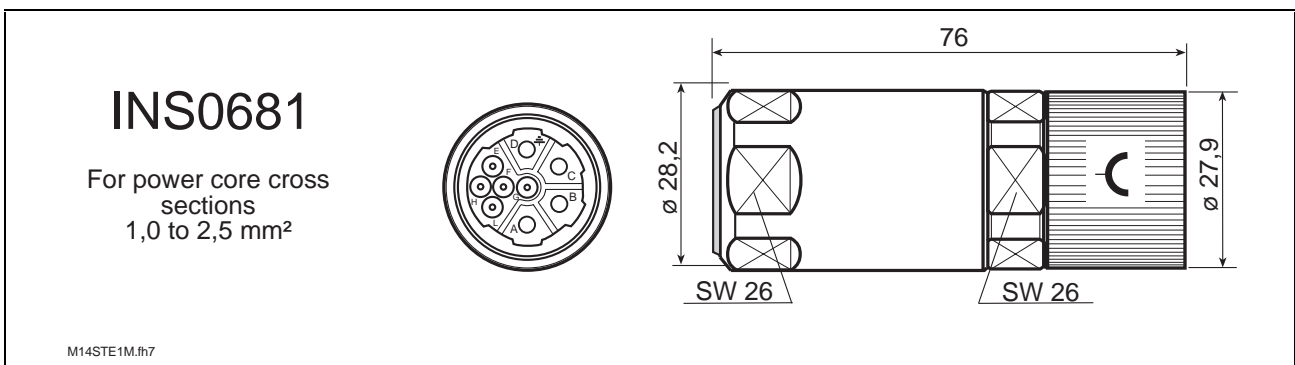


Fig. 2-2: INS0681 Connector with bushings

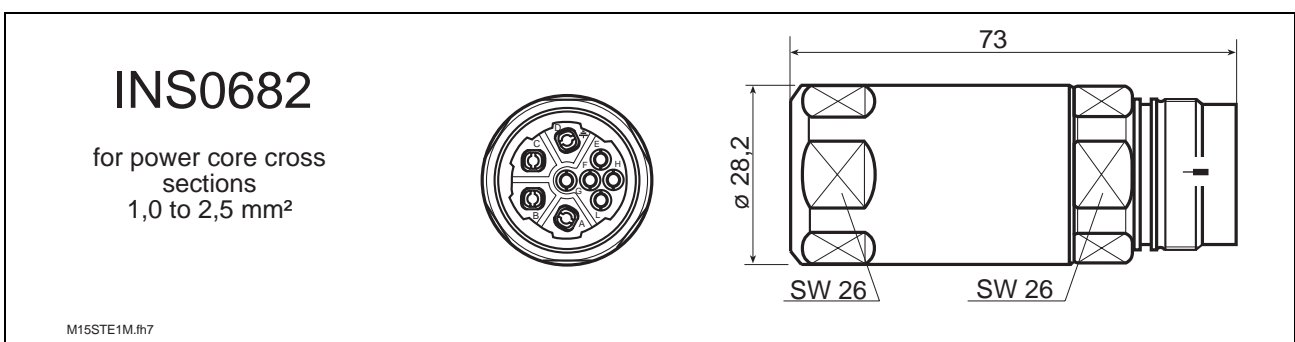


Fig. 2-3: INS0682 Coupling with pins

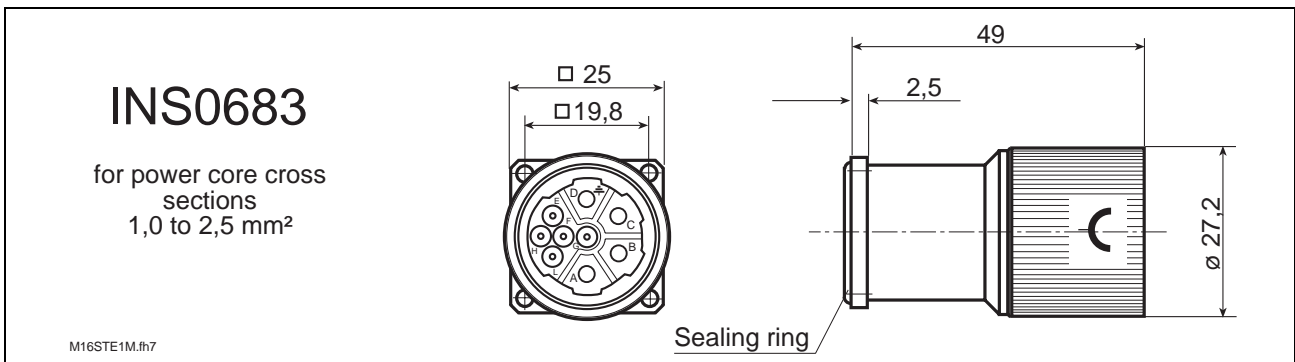


Fig. 2-4: INS0683 Flanged sockets with bushings

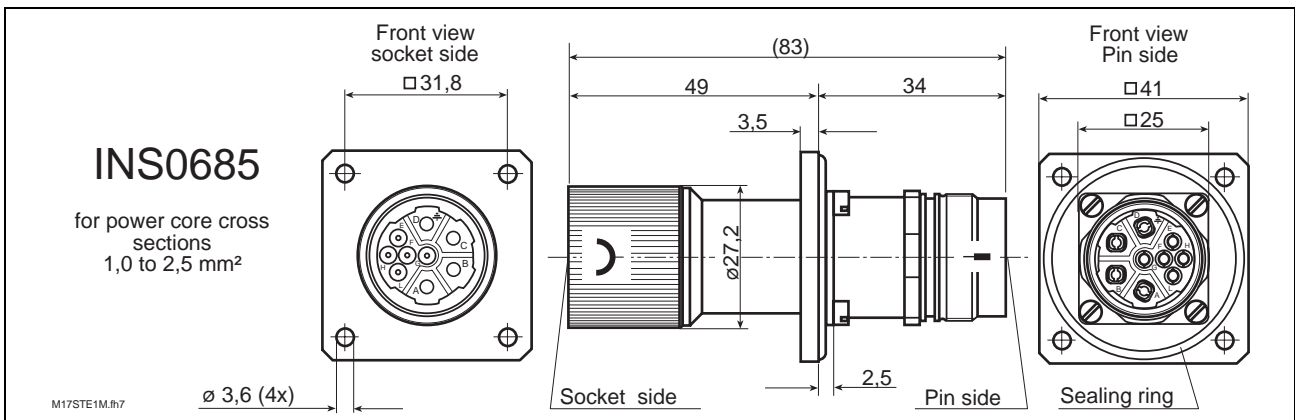


Fig. 2-5: INS0685 Leadthrough sockets

2.1.1 Contacts

Connector type	Contacts	Cross section in mm ²	Number	Assembly tool see	Disassembly tool see
INS0680/C03	power (Crimp pin)	2,5	4	Fig. 2-13	Fig. 2-15
	control (Crimp pin)	1,5	5	Fig. 2-14	Fig. 2-16
INS0681/C03	power (Crimp bushing)	2,5	4	not needed	not needed
	control (Crimp bushing)	1,5	5		
INS0682/C03	power (Crimp pin)	2,5	4		
	control (Crimp pin)	1,5	5		
INS0683/C03	power (Crimp bushing)	2,5	4		
	control (Crimp bushing)	1,5	5		
INS0685	Contacts firmly in place				

Fig. 2-6: Overview of contacts INS0680, -0681, -0682, -0683, -0685

2.1.2 Crimping tool

Crimping tool for power and control contacts

A manual crimping tool is available to crimp power and control contacts.

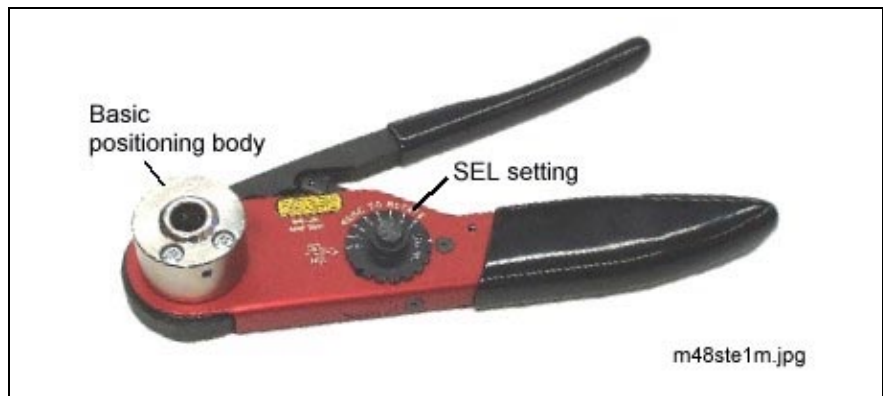


Fig. 2-7: Crimping tool for power and control contacts INS0680 to 0683

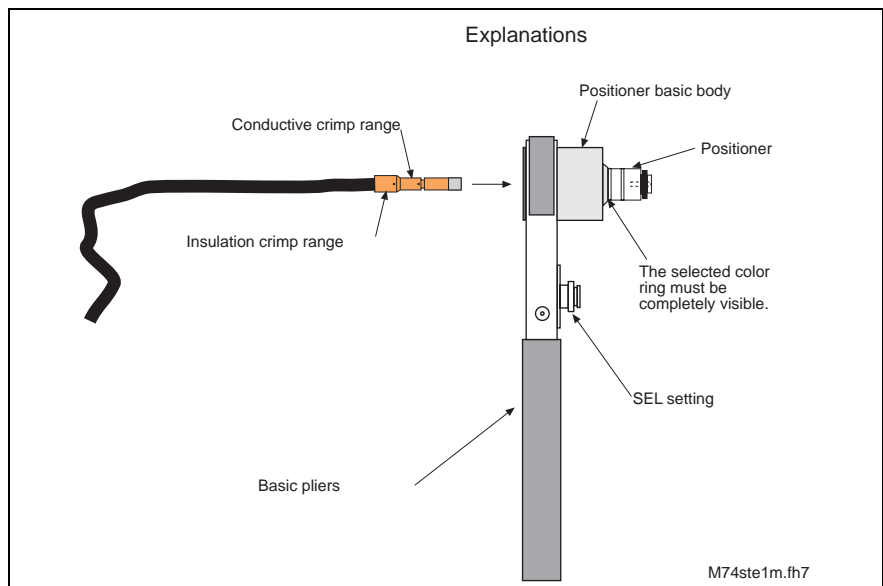


Fig. 2-8: Crimping tool INS0680 to 0683 - details and designations

Using the crimping tool

The manual crimping tool is made up of three parts:

- the hand crimping tool
- the basic positioning body
- and the positioner

Select the **appropriate positioner** before using the tool. Differentiate between whether the contacts to be crimped are for a plug-in connector (INS0681, INS0682, INS0683) or a flanged socket (INS0680).

The positioner is built into the basic body to accommodate positions for

- power contacts or
- control contacts.

Positioner for INS0681, INS0682, INS0683

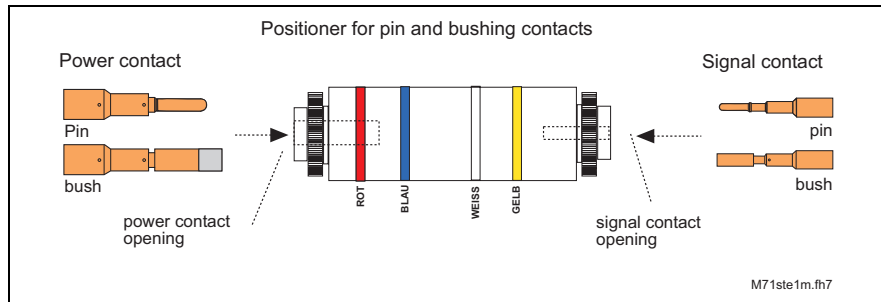


Fig. 2-9: Positioner for INS0681, INS0682, INS0683

The contacts for connectors INS0681, INS0682, INS0683 offer the option of insulation crimping.

Preparing the tool for crimping

1. Select the type of crimping:
Lead crimping **or** insulation crimping
2. Select the contact:
Power **or** control contact.
3. Insert positioner into basic body (see Fig. 2-10).
power contacts (visible color rings yellow **or** white/yellow)
control contacts (visible color rings red **or** blue/red)
4. Set exact position (lead or insulation crimping) and fix with mounting screw on side.

Note: The color rings of the positioner must be completely visible. When they are, then a clicking into position becomes clearly audible.

5. Set selector as per Fig. 2-10 .

Prepare crimping tool for crimping.

Note: The crimp contact must be crimped twice for an insulation crimping (for the insulation crimp settings see Fig. 2-10). The tool must be set each time.

Contact type	Cross section	Selector setting		Positioner (visible color rings)	
		Lead crimping	Insulation crimping	Lead crimping	Insulation crimping
power	1.0	4	6	yellow	white/yellow
power	1.5	4	7	yellow	white/yellow
power	2.5	6	8	yellow	white/yellow
control	0.75	2	4	red	blue/red
control	1.0	2	3	red	blue/red

Fig. 2-10: Crimp tool setting for INS0681/INS0682/INS0683

Positioner for INS0680

Positioner for flanged socket INS0680

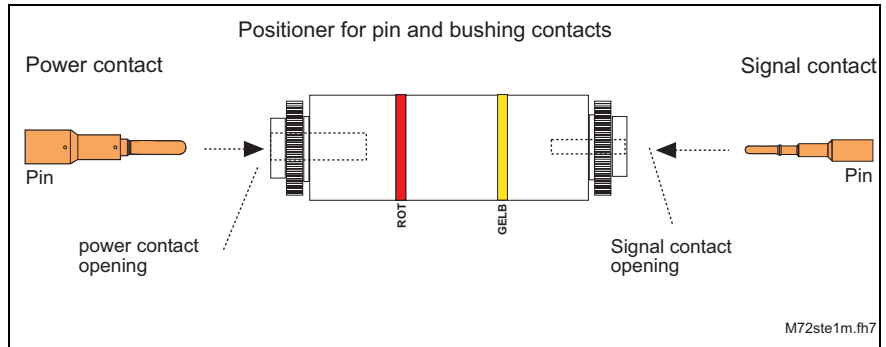


Fig. 2-11: Positioner for contacts INS0680

Prepare crimping tool for crimping

1. Select the contact:
Power **or** control contact.
2. Insert positioner into basic body (see Fig. 2-12).
power contacts (visible color ring yellow)
control contacts (visible color ring red).
3. Set exact position (lead or insulation crimping) and fix with mounting screw on side.

Note: The color rings of the positioner must be completely visible. When they are, then a clicking into position becomes clearly audible.

4. Set selector as per Fig. 2-12.

The crimping tool is ready for crimping.

Contact type	Cross section	Selector setting	Positioner (visible color rings)
		Lead crimping	Lead crimping
power	0,5	2	yellow
power	0,75	2	yellow
power	1,0	4	yellow
power	1,5	4	yellow
power	2,5	6	yellow
control	0,75	2	red

Fig. 2-12: Crimping tool settings for INS0680

2.1.3 Mounting Tools

Mounting contacts with an angle flanged socket

To mount the contacts in this case, the housing lid of the rotating angle flanged socket must be removed. As this connector is made up of **two** different contact sizes, the following tools are needed for mounting:

- mounting tool for power contacts
- mounting tool for control contacts

The contacts are inserted into the mounted insulation body from behind.

Mounting tools for the contacts of the rotating angle flanged socket INS0680



Fig. 2-13: INS0680 mounting tool for power contacts



Fig. 2-14: INS0680 mounting tool for control contacts

Mounting tool for the power and control contacts of the plug-in connector

Mounting the cable connector contacts

No tools are needed. The contact carrier of the connector has been attached in such a way that the lead contacts crimped on the side of the cable can be pressed into place. The signal contacts can easily and without any tools be inserted from behind into the appropriate openings.

2.1.4 Disassembly tools

Removing contacts of a cable connector

No special tools are needed to remove contacts. To do so, pull contact carrier out of the body of the housing of the insulation. Just clap open the flaps on the side. The power contacts can now be clipped out to the side and the control contacts pulled out towards the back.

Removing contacts of a rotary angle flanged socket

Use the tools illustrated below. They are inserted over the pin contacts and pressed against the insulating body. Press the ram against the contact.



Fig. 2-15: INS0680 Disassembly tool for power contacts



Fig. 2-16: INS0680 Disassembly tool for control contacts

2.1.5 Assembly Instructions INS0680

The steps on assembling flanged socket INS0680 are described below.

Note: Use an appropriate tool to assemble the cable connections on the motor.

The stripping lengths are listed below.

Designation	Stripping lengths
power cores	6.5 mm
control strands and shield connecting litz wires	5.0 mm

Fig. 2-17: Stripping lengths INS0680

1. Unscrew flanged socket lid (see Fig. 2-19).
2. Crimp pin contacts as shown in „section 2.1.2 Crimping tool“.
3. Mount pin contacts (Mounting tool see Fig. 2-13, Fig. 2-14).

Strand designation	Contact designation Connector size 1
U	A
V	B
W	C
GN/YE	D
TM+ or T1	E
TM - or T2	H
Br+ or BR	F
Br- or 0V _B	G
empty	L

Fig. 2-18: Connections for INS0680 (Motor flanged socket)

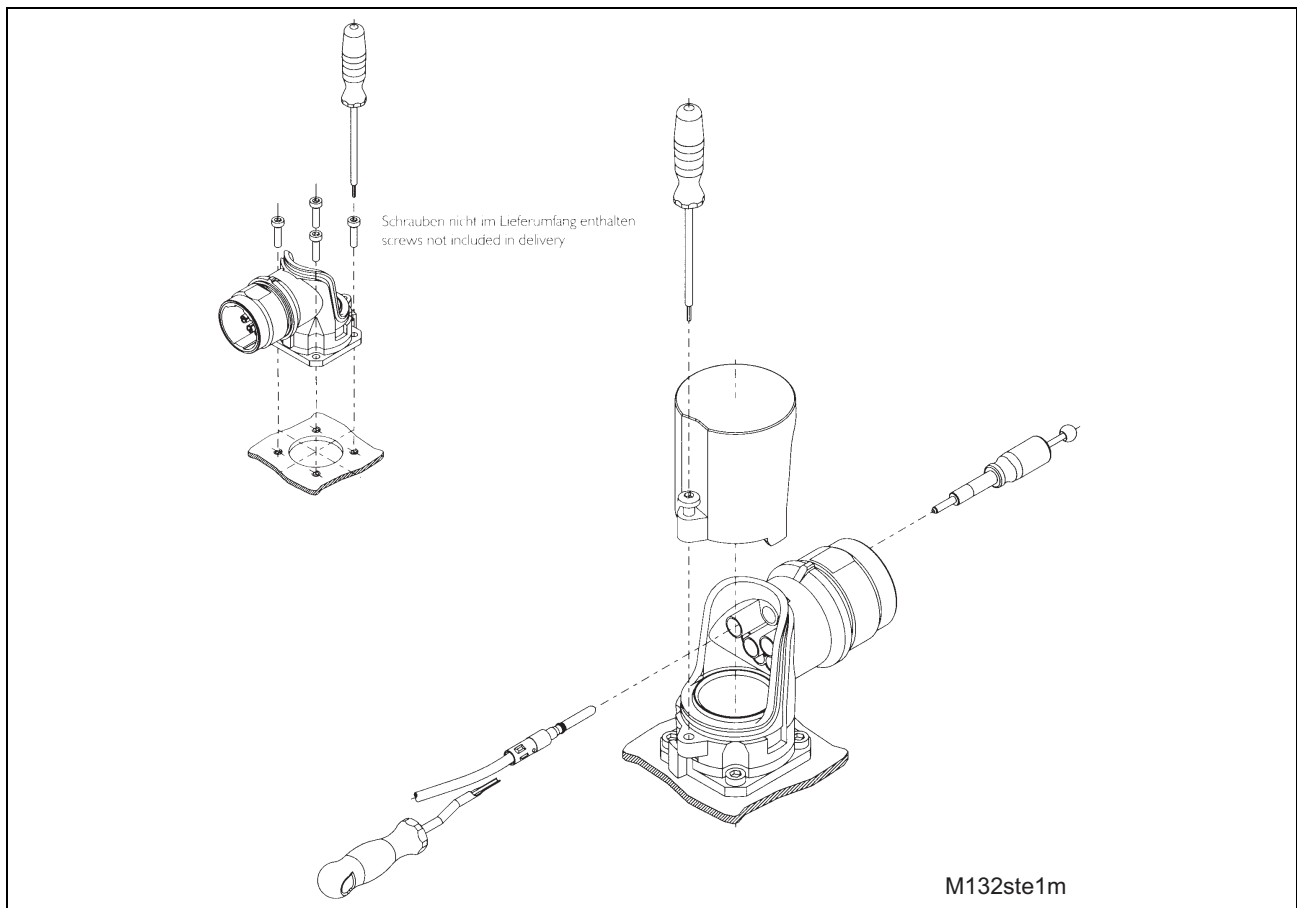


Fig. 2-19: Assembly INS0680

Note: To remove pin contacts use tool (see Fig. 2-15, Fig. 2-16).

2.1.6 Assembly Instructions INS0681

The following steps describe how to assemble the cable connections on the motor.

Note: Use an appropriate tool to assemble the cable connections on the motor.

Power cable for Connector size INS0681 Dismantling and stripping lengths are listed below.

Designation	Dismantling length	Shoulder length	Stripping length
External mantle	55 mm	---	---
power cores	---	Shorten to 45 mm	6.5 mm
control strands and shield connecting litz wires	---	Shorten to 53 mm	5.0 mm

Fig. 2-20: Dismantling, shoulder and stripping lengths of power cable INS0681

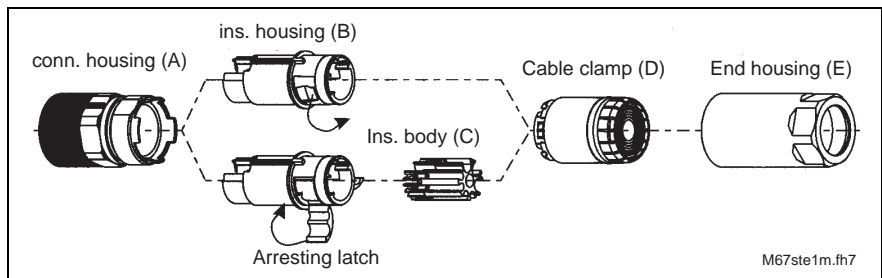


Fig. 2-21: Individual parts INS0681

1. Extension with variable cable clamp (A) can be matched to the cable diameter by punching out the excess sealing ring using a screw driver (see Fig. 2-22)

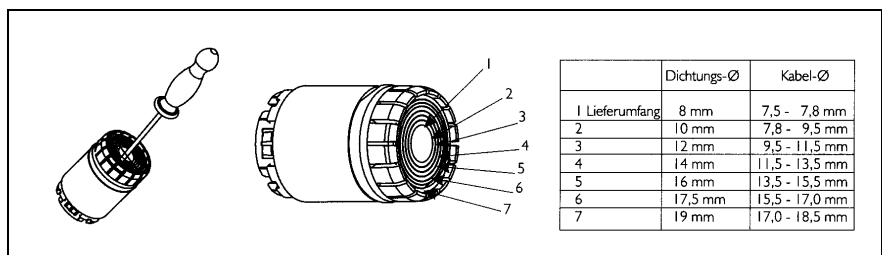


Fig. 2-22: Adapting cable clamp INS0681

2. End housing (E) and cable clamp (D) must be pushed over the cable.
3. Dismantle the power cable, shorten entire shield to 20 mm and pull it back over the external cable mantle.
4. Push shrink sleeve 5 mm over the strand bundle and shrink using hot air.

5. Remove all tape and cut off the textile fibers flush with the shrink sleeve.
6. Shield intertwining of strand pairs must be combed out and laid bare along with the filler litz wires
7. Cut shield intertwining off flush with the shrink sleeve.
8. Twist filler litz wires of strand pairs, shorten to 15 mm and solder on shield connecting litz wires (grey) (length of litz wires 50 mm; cross section 0.75 mm²)
9. Pull shrink sleeve over soldering location (length 15mm) and shrink.
10. Foil lamination and clear foil of the control strands must be removed and cut off flush with shrink sleeve.
11. Strip cores as per Fig. 2-20.

Crimping contacts

12. Crimping power and control contacts with the crimping tool (note settings for tool and positioner, see 2.1.2 Crimping tool).

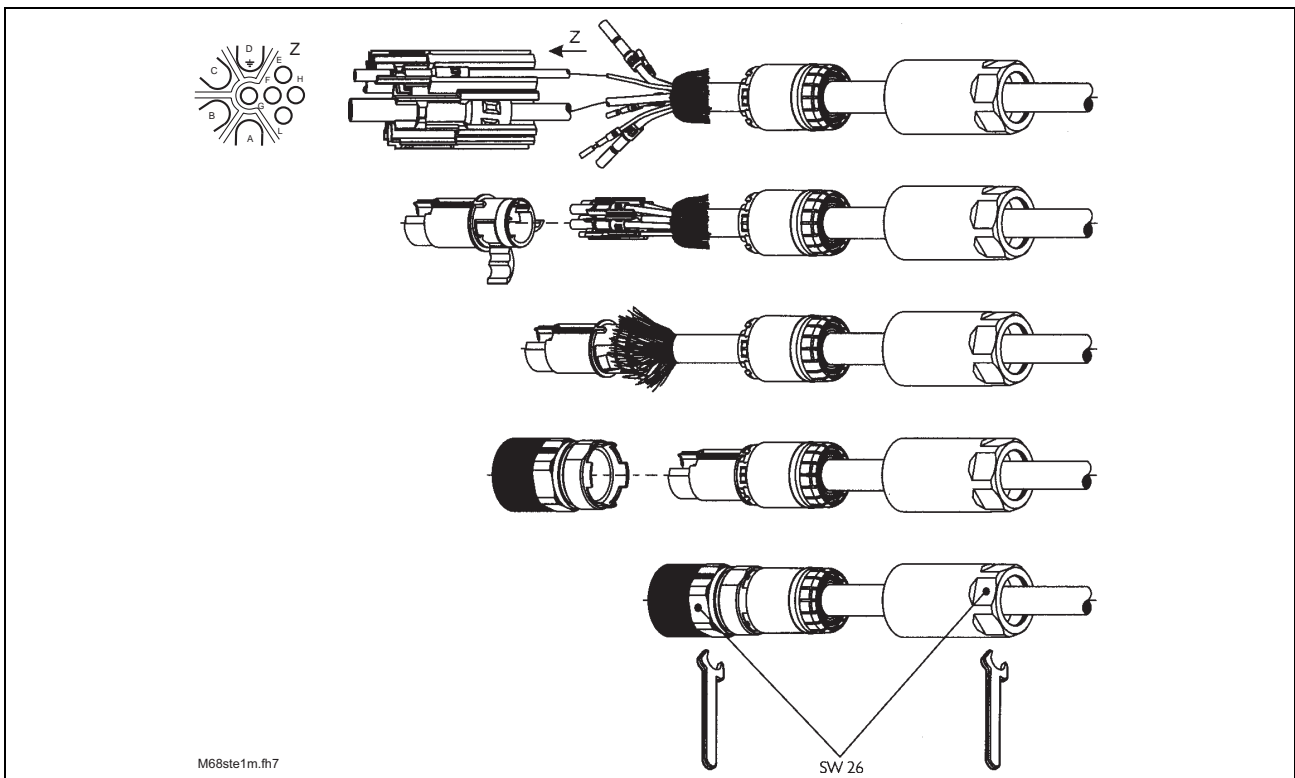


Fig. 2-23: INS0681 mounting

13. Fit contacts onto insulation (C) as per diagram (see Fig. 2-24). Procedure: first climp in power contacts then control contacts.

Strand designations	Contact designations Connector size 1
1	A
2	B
3	C
GN/YE	D
5	E
6	H
7	F
8	G
shield connecting litz wires (gray)	L

Fig. 2-24: Connections of INS0681

Note: No tool needed to mount contacts !

14. Push insulating body (C) with mounted contacts into insulation housing (B) into latches until the end.
15. Close the latches and fold the shield forward over the entire insulation housing (B).
16. Push cable clamps (D) onto insulation housing (B).

Note: Make sure that the shield intertwining lies between the metal ring of the housing (B) and the metal sleeve of the cable clamp (D). The nose of the housing (B) must reach into the secure slot of the cable clamp (D) when pushed together.

17. Insert mounted insulation unit (B, C, D) into connector housing (A). The insulation recess on the ground contact must grip into the metal ground contact connection of the connector housing (A).
18. Screw end housing (E) onto connector housing (A) using the two wrenches (SW26). Tighten connector housing (a) in until it hits the end (metal end). There may be an opening of a maximum of 0.5 mm between connector housing and sleeve whereby the O-ring may no longer be visible.

The connector is now ready!

2.1.7 Assembly Instructions INS0682

The procedure on assembling the cable connections of the motor are described below.

Note: Use an appropriate tool to assemble the cable connections on the motor.

Power cable for coupling INS0682

Dismantling and stripping lengths are listed below.

Designation	Dismantling length	Shoulder length	Stripping length
External mantle	55 mm	---	---
power cores	---	Shorten to 45 mm	6.5 mm
control strands and shield connecting litz wires	---	Shorten to 53 mm	5.0 mm

Fig. 2-25: Dismantling, shoulder and stripping lengths of power cable INS0682

1. Take the coupling apart, remove insulation body with pointed tools or tweezers (see Fig. 2-26).

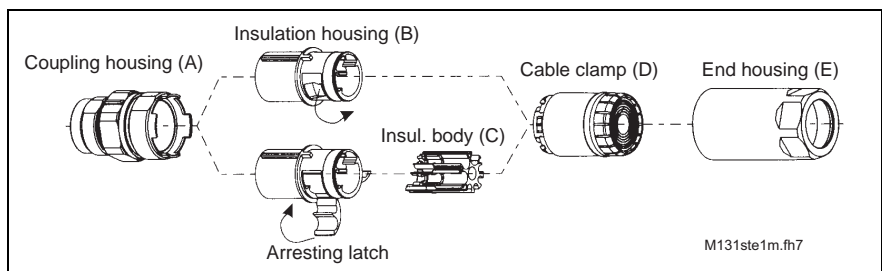


Fig. 2-26: Individual parts INS0682

2. Adapt variable cable clamp (D) to the cable diameter by pushing out excess sealing ring with a screw driver (see Fig. 2-27)

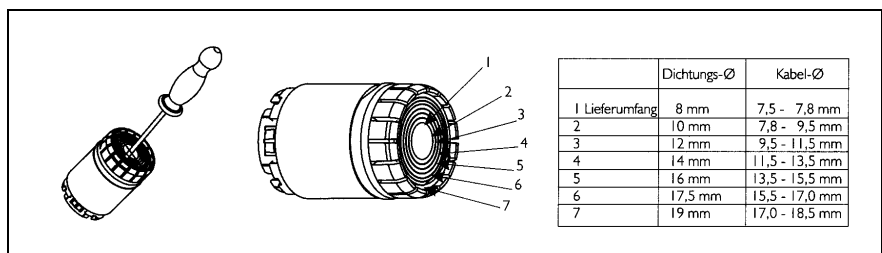


Fig. 2-27: INS0682 adapting the cable clamp

3. End housing (E) and cable clamp (D) must be pushed over the cable.
4. Dismantle the power cable, shorten shield to 20 mm and fold back over external mantle of cable.
5. Push sleeve 5 mm over strand bundle and shrink with hot air.

6. Remove all tape and cut off with the textile fibers flush with the shrink sleeve.
 7. Shield intertwining of strand pairs must be combed out and laid bare along with the filler litz wires.
 8. Cut shield intertwining off flush with the shrink sleeve.
 9. Twist filler litz wires of strand pairs, shorten to 15 mm and solder on shield connecting litz wires (grey) (length of litz wires 50 mm; cross section 0.75 mm²)
 10. Pull shrink sleeve over soldering location (length 15mm) and shrink.
 11. Foil lamination and clear foil of the control strands must be removed and cut off flush with shrink sleeve.
 12. Strip cores as per Fig. 2-25.
- Crimping contacts**
13. Crimp power and control contacts with crimping tool, material number 274106 (Note tool and positioner settings, see 2.1.2 Crimping tool). After crimping, the front side of the contacts must be level.

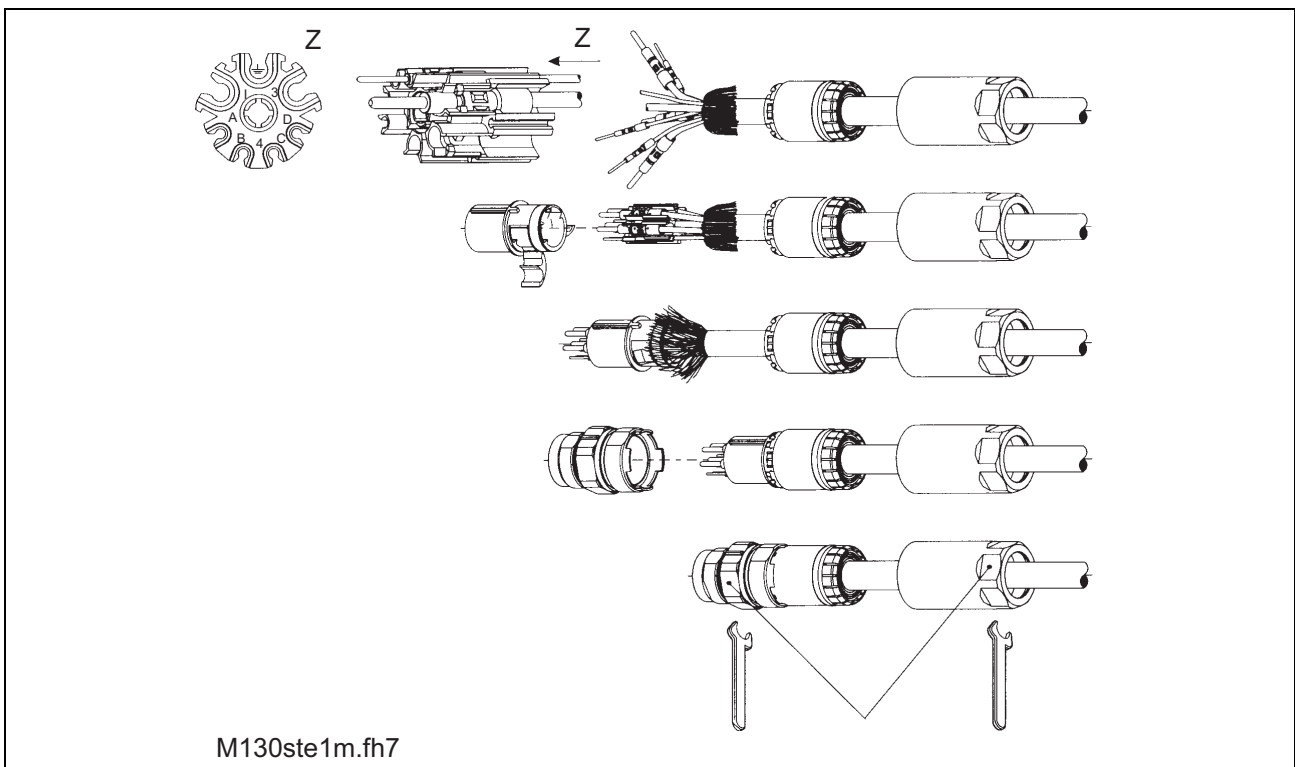


Fig. 2-28: Assembling coupling INS0682

14. Fit insulation (C) (see Fig. 2-29) with appropriate contacts. Procedure: first click power then control contacts.

Core designations	Contact designation Connector size 1
1	A
2	B
3	C
GN/YE	D
5	E
6	H
7	F
8	G
shield connecting litz wires (gray)	L

Fig. 2-29: Connection allocations INS0682

Note: No tool needed for mounting !

15. Push insulating body (C) with mounted contacts into insulation housing (B) into latches until the end.

16. Close the latches and fold the shield forward over the entire insulation housing (B).

17. Push cable clamps (D) onto insulation housing (B).

Note: Make sure that the shield intertwining lies between the metal ring of the housing (B) and the metal sleeve of the cable clamp (D). The nose of the housing (B) must reach into the secure slot of the cable clamp (D) when pushed together.

18. Insert mounted insulation unit (B, C, D) into connector housing (A). The insulation recess on the ground contact must grip into the metal ground contact connection of the connector housing (A).

19. Screw end housing (E) onto connector housing (A) using the two wrenches (SW26). Tighten connector housing (a) in until it hits the end (metal end). There may be an opening of a maximum of 0.5 mm between connector housing and sleeve whereby the O-ring may no longer be visible.

The coupling is ready !

2.1.8 Assembly Instructions INS0683

in preparation

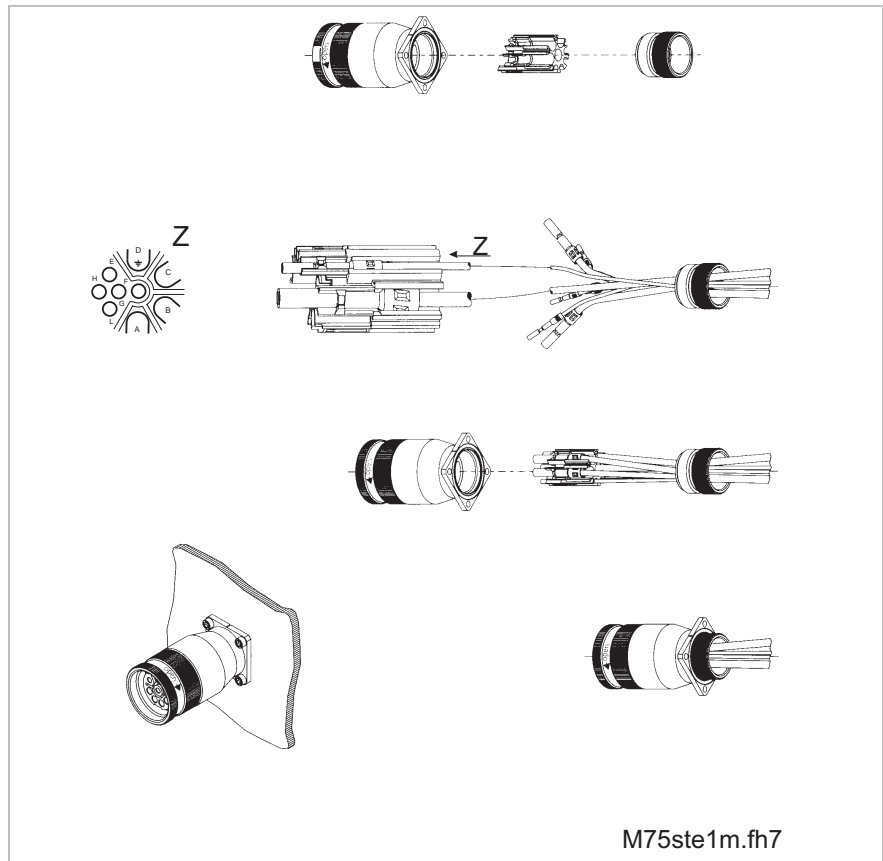


Fig. 2-30: Assembling INS0683

2.1.9 Assembly Instructions INS0685

The assembly sizes of the leadthrough sockets INS0685 are listed in Fig. 2-5. The contacts do not have to be fitted.

2.2 Connector size II (INS0480, INS0481, INS0482, INS0483, INS0484, INS0486)

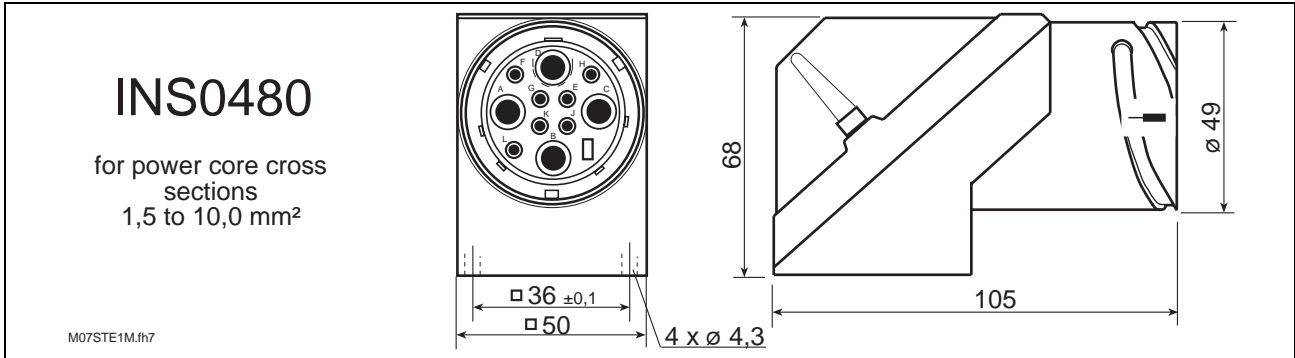


Fig. 2-31: INS0480 angle flanged socket with pins

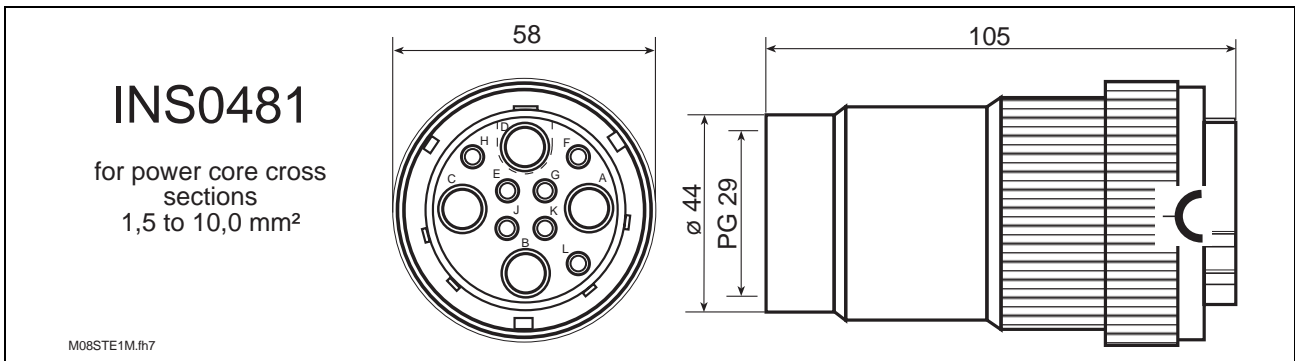


Fig. 2-32: INS0481 Connector with bushings

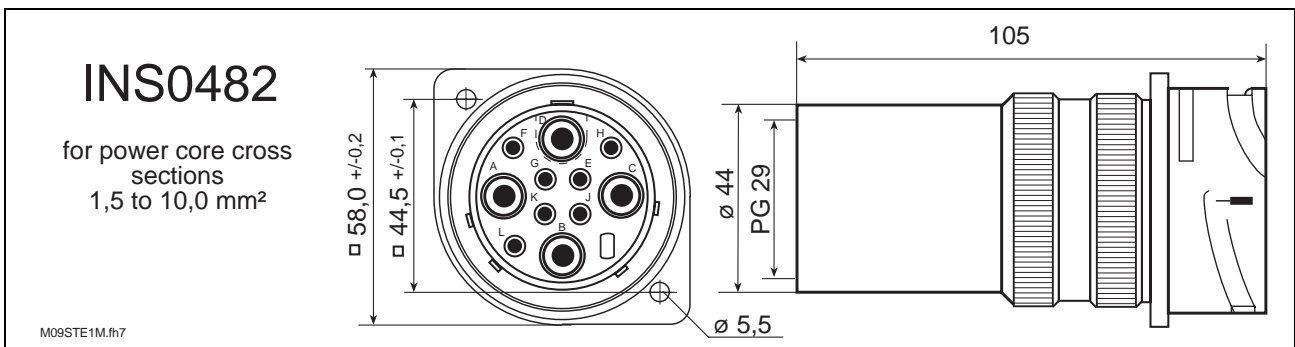


Fig. 2-33: INS0482 Coupling with pins

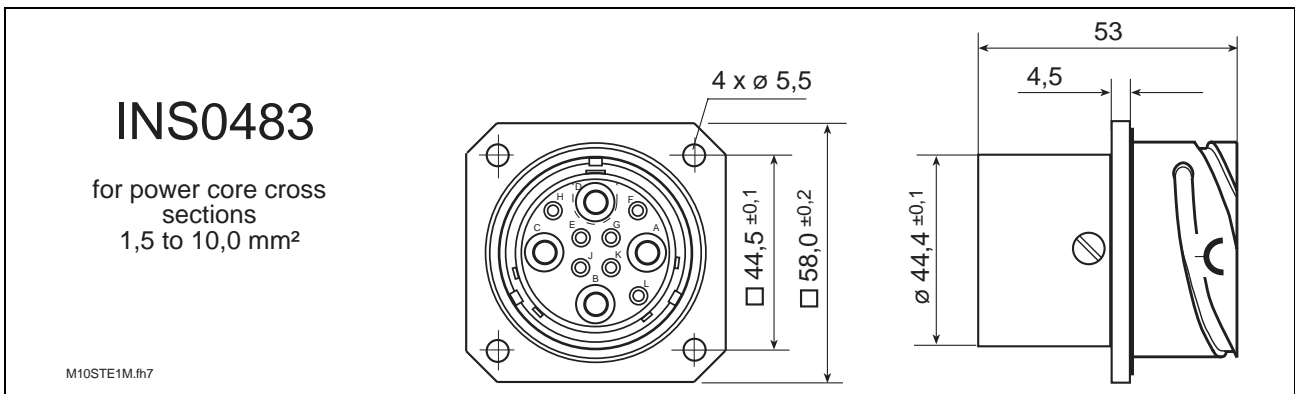


Fig. 2-34: INS0483 Flanged socket with bushings

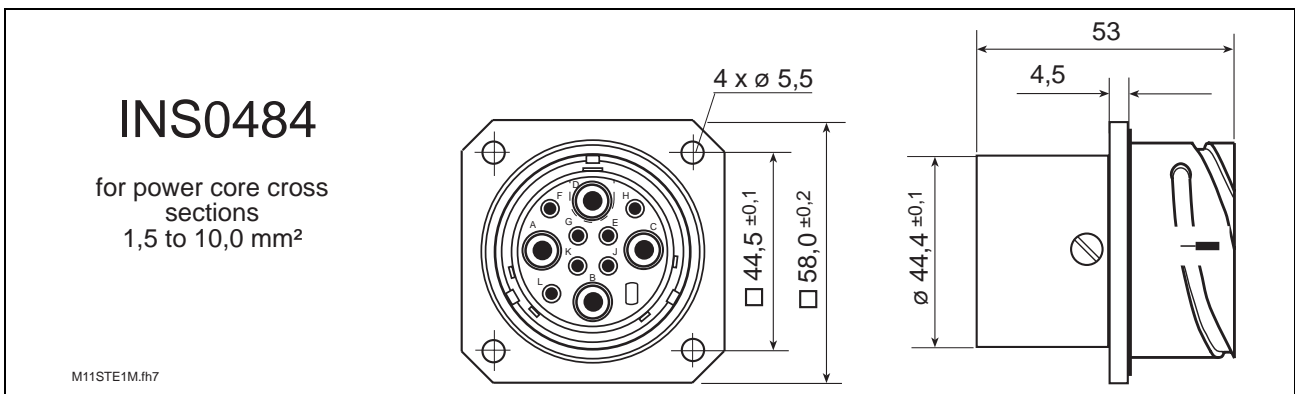


Fig. 2-35: INS0484 Flanged socket with pins

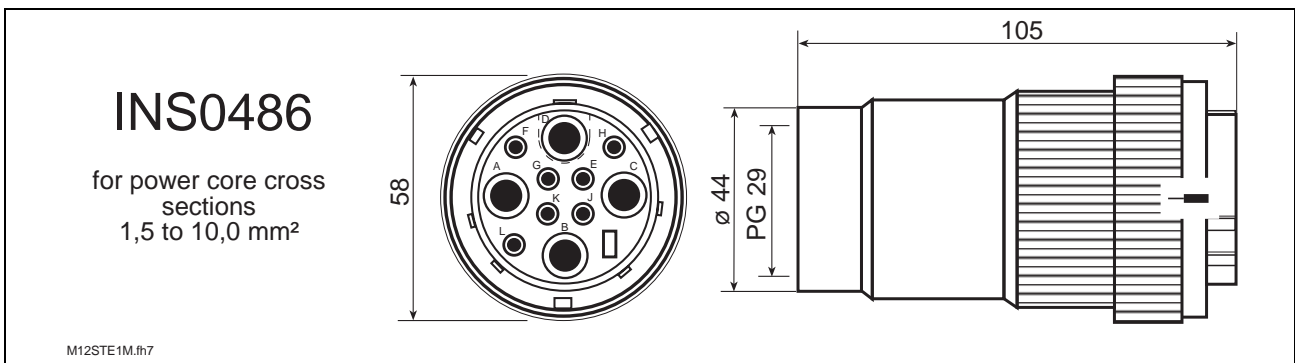


Fig. 2-36: INS0486 Connector with pins

2.2.1 Contacts

Connector type	Contacts	Cross section in mm ²	Number	Mounting tool see	Dismantling tool see
INS0480/C02	power (Crimp pin)	1.5	3	not needed	Fig. 2-41
	ground (Crimp pin)	1.5	1		not needed
	control (Crimp pin)	1.5	7		Fig. 2-42
INS0480/C03	power (Crimp pin)	2.5	3		Fig. 2-41
	ground (Crimp pin)	2.5	1		not needed
	control (Crimp pin)	1.5	7		Fig. 2-42

Continued on next page

Connector type	Contacts	Cross section in mm ²	Number	Mounting tool see	Dismantling tool see
INS0480/C04	power (Crimp pin)	4.0	3	not needed	Fig. 2-41
	ground (Crimp pin)	4.0	1		not needed
	control (Crimp pin)	1.5	7		Fig. 2-42
INS0480/C06	power (Crimp pin)	6.0	3		Fig. 2-41
	ground (Crimp pin)	6.0	1		not needed
	control (Crimp pin)	1.5	7		Fig. 2-42
INS0480/L10	power (soldering pin)	10.0	3		Fig. 2-41
	ground (soldering pin)	10.0	1		not needed
	control (soldering pin)	1.5	7		Fig. 2-42
INS0481/C02	power (Crimp bushing)	1.5	3		Fig. 2-41
	ground (Crimp bushing)	1.5	1		not needed
	control (Crimp bushing)	1.5	7		Fig. 2-42
INS0481/C03	power (Crimp bushing)	2.5	3		Fig. 2-41
	ground (Crimp bushing)	2.5	1		not needed
	control (Crimp bushing)	1.5	7		Fig. 2-42
INS0481/C04	power (Crimp bushing)	4.0	3		Fig. 2-41
	ground (Crimp bushing)	4.0	1		not needed
	control (Crimp bushing)	1.5	7		Fig. 2-42
INS0481/C06	power (Crimp bushing)	6.0	3		Fig. 2-41
	ground (Crimp bushing)	6.0	1		not needed
	control (Crimp bushing)	1.5	7		Fig. 2-42
INS0481/L10	power (soldering bushing)	10.0	3		Fig. 2-41
	ground (soldering bushing)	10.0	1		not needed
	control (soldering bushing)	1.5	7		Fig. 2-42
INS0482/C02	power (Crimp pin)	1.5	3		Fig. 2-41
	ground (Crimp pin)	1.5	1		not needed
	control (Crimp pin)	1.5	7		Fig. 2-42
INS0482/C03	power (Crimp pin)	2.5	3		Fig. 2-41
	ground (Crimp pin)	2.5	1	not needed	
	control (Crimp pin)	1.5	7	Fig. 2-42	
INS0482/C04	power (Crimp pin)	4.0	3	Fig. 2-41	
	ground (Crimp pin)	4.0	1	not needed	
	control (Crimp pin)	1.5	7	Fig. 2-42	
INS0482/C06	power (Crimp pin)	6.0	3	Fig. 2-41	
	ground (Crimp pin)	6.0	1	not needed	
	control (Crimp pin)	1.5	7	Fig. 2-42	
INS0482/L10	power (soldering pin)	10.0	3	Fig. 2-41	
	ground (soldering pin)	10.0	1	not needed	
	control (soldering pin)	1.5	7	Fig. 2-42	
INS0483/C02	power (Crimp bushing)	1.5	3	Fig. 2-41	
	ground (Crimp bushing)	1.5	1	not needed	
	control (Crimp bushing)	1.5	7	Fig. 2-42	
INS0483/C03	power (Crimp bushing)	2.5	3	Fig. 2-41	
	ground (Crimp bushing)	2.5	1	not needed	
	control (Crimp bushing)	1.5	7	Fig. 2-42	

Continued on next page

Connector type	Contacts	Cross section in mm ²	Number	Mounting tool see	Dismantling tool see
INS0483/C04	power (Crimp bushing)	4.0	3	not needed	Fig. 2-41
	ground (Crimp bushing)	4.0	1		not needed
	control (Crimp bushing)	1.5	7		Fig. 2-42
INS0483/C06	power (Crimp bushing)	6.0	3		Fig. 2-41
	ground (Crimp bushing)	6.0	1		not needed
	control (Crimp bushing)	1.5	7		Fig. 2-42
INS0483/L10	power (soldering bushing)	10.0	3		Fig. 2-41
	ground (soldering bushing)	10.0	1		not needed
	control (soldering bushing)	1.5	7		Fig. 2-42
INS0484/C02	power (Crimp pin)	1.5	3		Fig. 2-41
	ground (Crimp pin)	1.5	1		not needed
	control (Crimp pin)	1.5	7		Fig. 2-42
INS0484/C03	power (Crimp pin)	2.5	3		Fig. 2-41
	ground (Crimp pin)	2.5	1		not needed
	control (Crimp pin)	1.5	7		Fig. 2-42
INS0484/C04	power (Crimp pin)	4.0	3		Fig. 2-41
	ground (Crimp pin)	4.0	1		not needed
	control (Crimp pin)	1.5	7		Fig. 2-42
INS0484/C06	power (Crimp pin)	6.0	3		Fig. 2-41
	ground (Crimp pin)	6.0	1		not needed
	control (Crimp pin)	1.5	7		Fig. 2-42
INS0484/L10	power (soldering pin)	10.0	3	Fig. 2-41	
	ground (soldering pin)	10.0	1	not needed	
	control (soldering pin)	1.5	7	Fig. 2-42	
INS0486/C02	power (Crimp pin)	1.5	3	Fig. 2-41	
	ground (Crimp pin)	1.5	1	not needed	
	control (Crimp pin)	1.5	7	Fig. 2-42	
INS0486/C03	power (Crimp pin)	2.5	3	Fig. 2-41	
	ground (Crimp pin)	2.5	1	not needed	
	control (Crimp pin)	1.5	7	Fig. 2-42	
INS0486/C04	power (Crimp pin)	4.0	3	Fig. 2-41	
	ground (Crimp pin)	4.0	1	not needed	
	control (Crimp pin)	1.5	7	Fig. 2-42	
INS0486/C06	power (Crimp pin)	6.0	3	Fig. 2-41	
	ground (Crimp pin)	6.0	1	not needed	
	control (Crimp pin)	1.5	7	Fig. 2-42	
INS0486/L10	power (soldering pin)	10.0	3	Fig. 2-41	
	ground (soldering pin)	10.0	1	not needed	
	control (soldering pin)	1.5	7	Fig. 2-42	

Fig. 2-37: Overview of contacts INS0480 to 0486

2.2.2 Crimping tool

Crimping tool for power and control contacts

To crimp both power and control contacts use the manual crimping tool. This tool is made up of two individual components (the tools and the contact positioner).

The tools are suited to crimp

- control contact (cross sections of connections 0.75;1.0; 1.5 mm²)
- power contact (cross sections of connections 1.5; 2.5; 4 and 6 mm²).

The tool settings are listed below.

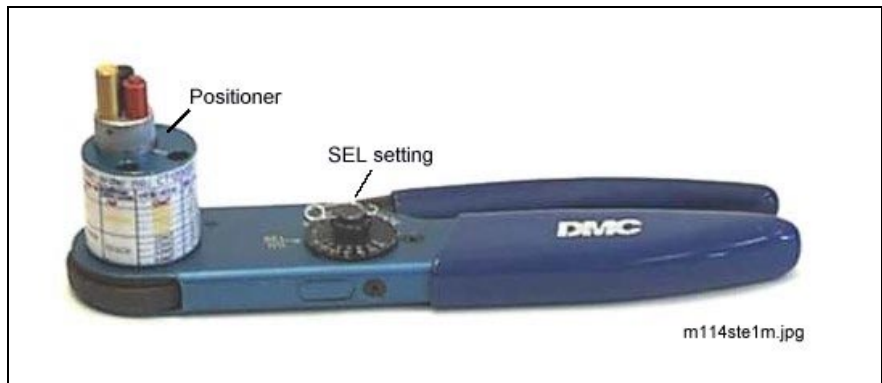


Fig. 2-38: Crimping tool for INS0480 to 0486

Contact type		Cross section	Selector setting	Positioner color	
power	control				
pin		1.5 mm ²	2	yellow	yellow
pin		2.5 mm ²	3	yellow	yellow
pin		4.0 mm ²	3	yellow	yellow
pin		6.0 mm ²	4	yellow	yellow
bushing		1.5 mm ²	2	black	black
bushing		2.5 mm ²	3	black	black
bushing		4.0 mm ²	3	black	black
bushing		6.0 mm ²	4	black	black
	pin	0.75 mm ²	1	red	red
	pin	1.0 mm ²	2	red	red
	pin	1.5 mm ²	2	red	red
	bushing	0.75 mm ²	1	red	red
	bushing	1.0 mm ²	2	red	red
	bushing	1.5 mm ²	2	red	red

Fig. 2-39: Settings for crimping tool for INS0480 to 0486

Crimping tool for the ground contact

A crimping tool is needed for the ground contact. It has a crimp stamp especially made for Indramat. This stamp has three different crimp openings whereby crimping (1) should be used for this contact (see Fig. 2-40).

Note: The crimp tool is used for the ground contacts of connector sizes 10, 22 and II.



Fig. 2-40: Crimping tool for ground contacts INS0480 to 0486

2.2.3 Assembly tool

Assembly tool for contacts No tools are needed to assemble the power, control and ground contacts. With the help of the crimped or soldered lit wires, the contacts can easily be inserted from the back into the insulation body of the connectors.

Note: The contacts must be pushed into until they clearly click into their locking position.

2.2.4 Disassembly tools

Disassembly tool for power and control contacts. Special tools are needed for disassembly. These tools have two half shells that are inserted from behind into the insulation body and pressed against the contact (unlocking the contacts).

How to proceed:

1. Insert disassembly tool from behind into insulation body.
2. Unlock contacts while simultaneously pulling contacts at litz wires out.

No tools are needed to remove ground contacts. Only the grounding screw has to be unscrewed to pull the contact out.



Fig. 2-41: Disassembly tool for power contacts INS0480 to 486



Fig. 2-42: Disassembly tool for control contacts INS0480 to 486

2.2.5 Assembly Instructions for INS0480

The steps on making flanged socket INS0480 are described below.

Note: Use an appropriate tool to assemble the cable connections on the motor.

Stripping lengths are listed below.

Designation	Stripping lengths
power cores	7.0 mm
control strands	7.0 mm

Fig. 2-43: Stripping lengths INS0480

1. Remove flanged socket lid (see Fig. 2-45).
2. Crimp pin contacts as per „section 2.2.2 Crimping tool “.
3. Mount pin contacts (no special tool needed).

Core designations	Contact designation Connector size II
U	A
V	B
W	C
GN/YE	D
TM+ or T1	E
TM - or T2	H
Br+ or BR	F
Br- or 0V _B	G
empty	L

Fig. 2-44: Connection allocations INS0480 (flanged motor socket)



Fig. 2-45: Assembling INS0480

Note: Use tool to remove pin contacts (see Fig. 2-41, Fig. 2-42).

4. Remount flanged socket lid. Tightening torque of the two screws is $3.1 \text{ Nm} \pm 10\%$.

Flanged socket is ready.

2.2.6 Assembly Instructions for INS0481 / INS0482 / INS0486

Power cable for Connector size II Dismantling and stripping lengths are listed below.

Designation	Dismantling length	Shoulder length	Stripping length
external mantle	75 mm	---	---
power cores 1,2,3	---	Shorten to 60 mm	7.0 mm
protective conductor GNYE	---	55 mm	7.0 mm
control strands	---	75 mm	7.0 mm
shield connecting litz wires	---	75 mm	7.0 mm

Fig. 2-46: Dismantling, shoulder and stripping lengths of power cables INS0481, -0482, -0486

Note: The conduit threads needed (and possibly the reductions) are not part of the overall delivery. The conduit thread sizes and the reductions must be selected as per the cable diameter and the conduit thread of the end housing.

1. Take connector apart (see Fig. 2-47).

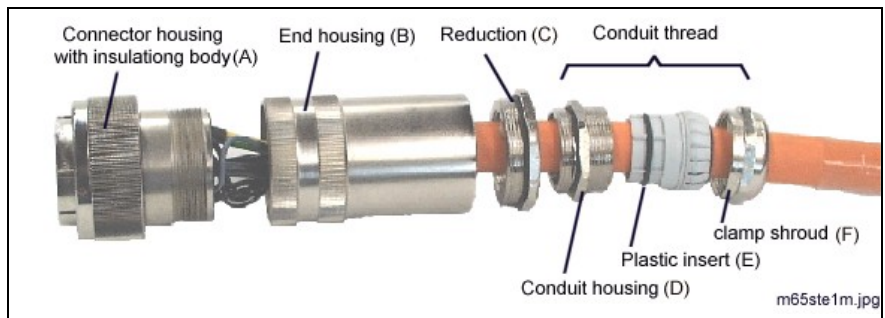


Fig. 2-47: Individual parts of connectors INS0481, -0482, -0486

2. Cable clamp (cable shroud (F), plastic insert (E), conduit housing (D) and reduction (C)) must be pushed over cable corresponding to outside cable diameter and end housing.
3. Shrink sleeve (G), length 30mm, pushed over cable outside mantle.
4. Dismantle power cable, comb total shield out, fold back over outside mantle and fix with tape.
5. Push shrink sleeve (H) 10 mm over strand bundle and shrink with hot air.
6. Remove all foils and cut off flush with textile fibers at shrink sleeve (H).

7. Comb shield intertwining of strand pairs out and lay bare along with litz wires.
8. Twist filter litz wires of the strand pairs (especially with shield intertwining) with each other.

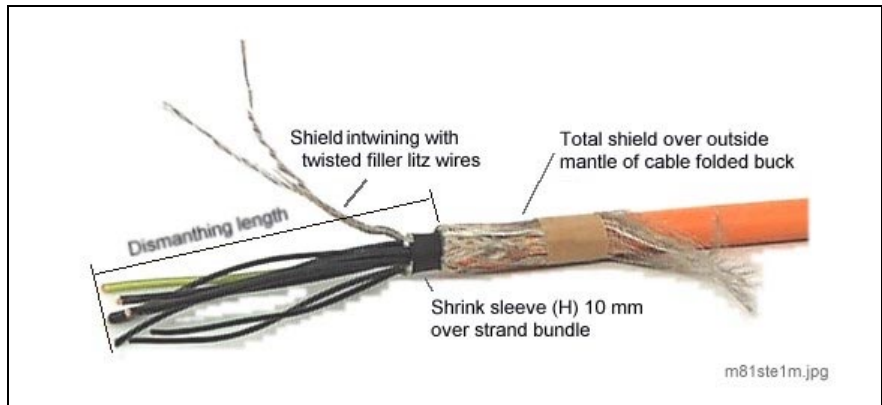


Fig. 2-48: Making power cables INS0481, -0482, -0486

9. Cut remaining shield intertwining off flush at shrink sleeve (H).
10. Shorten shield intertwining re-inforced litz wires to about 10 mm and solder grey litz wires on (length of litz wires 80 mm, cross section 1.0 mm²).
11. Secure soldering of filler litz wires with shrink sleeve (about 17 mm).
12. Dismantle and strip strands per Fig. 2-46.

Crimping contacts

13. Crimp the power and control contacts with crimping tool (see 2.2.2 Crimping tool). Note setting of tool!

Soldering contacts

Note: The contacts also can alternatively be soldered.

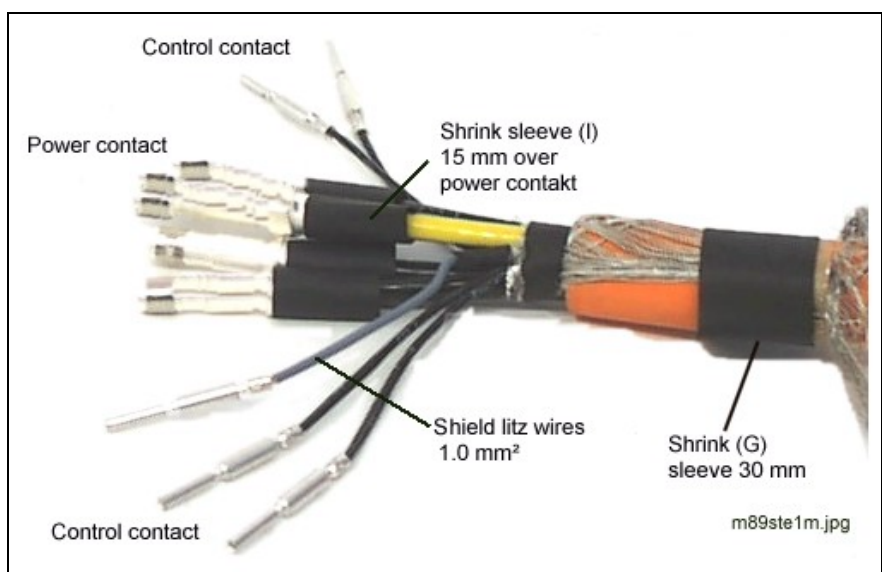


Fig. 2-49: Making contacts for INS0481, -0482, -0486

14. Pull shrink sleeve over contacts (I), length 15mm. Shrink sleeve should only cover contact by 5mm.
15. Fit contacts to insulating body (A) as per connection allocations (see Fig. 2-50). Procedure: first clip in power contacts, then control contacts.
16. Screw ground contact with mounting screws into insulation (A).

Core designations	Contact designation Connector size II
1	A
2	B
3	C
GN/YE	D
5	E
6	H
7	F
8	G
shield connecting litz wires (gray)	L

Fig. 2-50: Connection allocations for INS0481, -0482, -0486

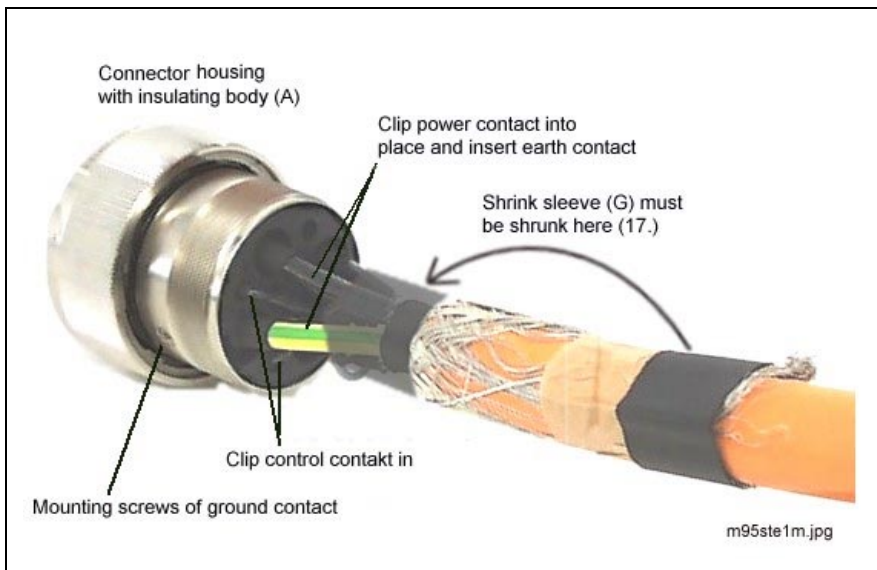


Fig. 2-51: Insulation body fittings for INS0481, -0482, -0486

Note: No special tools need to insert contacts!

17. Push shrink sleeve (G), length 30mm, over entire strand bundle and shrink.
18. Screw end housing (B) onto connector housing (A).

Note: The connector or coupling housing have to fixed into place when screwing.

Recommendation: Insert connector onto flanged socket or insert coupling.

Protection category IP67: To ensure this all the individual parts must be completely screwed into place!

19. Screw conduit thread (D) into end housing (B) and tighten with fork wrench a (use reduction (C) if needed).

20. Remove fixing of shield intertwining and insert plastic insert (E) into conduit thread (D). Place shield intertwining over plastic insert.

Note: Maintain tension when assembly intertwining. This prevents the intertwining from moving into the connector housing and possibly causing shorts.

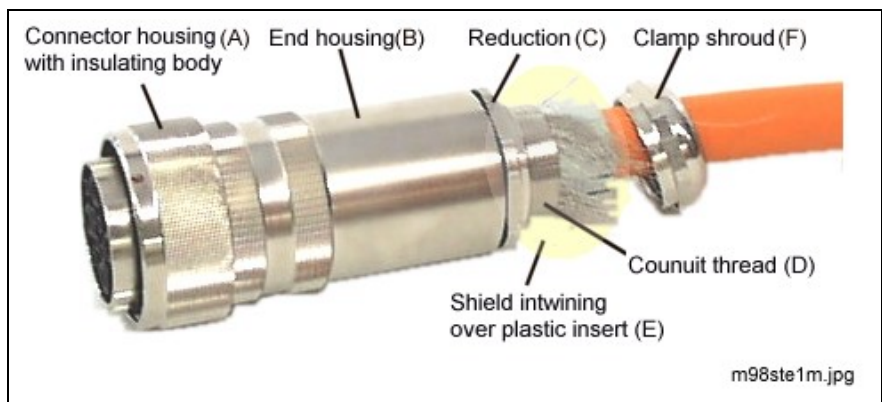


Fig. 2-52: Assembling conduit thread plastic insert INS0481, -0482, -0486

21. Cut excessive intertwining off a conduit thread (D).

22. Screw conduit thread (D) and clamp shroud (F) together with fork wrench.



Fig. 2-53: Assembling clamp shrouds INS0481, -0482, -0486

The connector is ready!

2.2.7 Assembly Instructions INS0483 / INS0484

The steps on making flanged sockets INS0483 / INS0484 are described below.

Note: Use an appropriate tool to assemble the cable connections on the motor.

Stripping lengths are listed below.

Designation	Stripping lengths
power cores	7.0 mm
control strands and shield connecting litz wires	7.0 mm

Fig. 2-54: Stripping lengths INS0483 / INS0484

1. Crimp contacts as per „section 2.2.2 Crimping tool“.
2. Fit insulation body per Fig. 2-55.
3. Assembly contacts (no special tool needed).

Core designations	Contact designation Connector size II
1	A
2	B
3	C
GN/YE	D
5	E
6	H
7	F
8	G
shield connecting litz wires (gray)	L

Fig. 2-55: Connection allocations INS0483 / INS0484

Note: Use tool to disassembly contacts (see Fig. 2-41, Fig. 2-42).

Flanged socket is ready.

2.3 Connector size III (INS0380, INS0381, INS0382, INS0383, INS0384, INS0386)

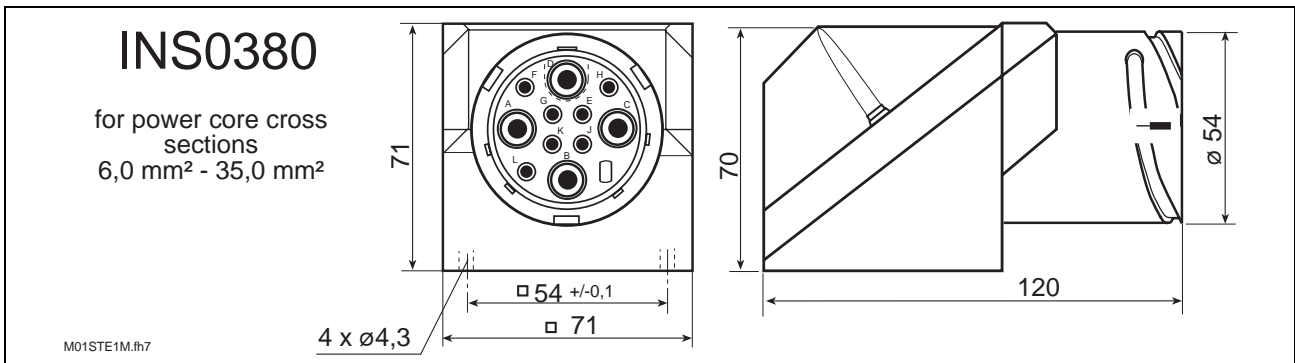


Fig. 2-56: INS0380 flanged motor socket pins

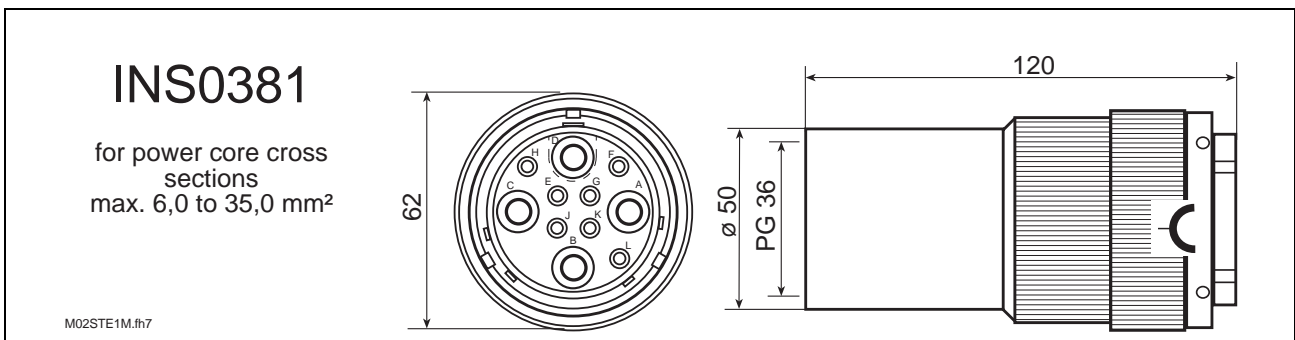


Fig. 2-57: INS0381 Connector bushings

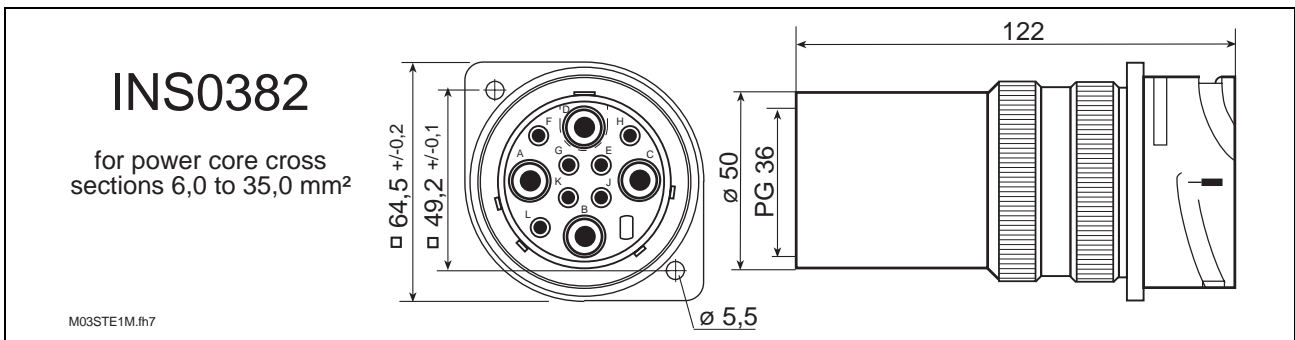


Fig. 2-58: INS0382 Coupling pins

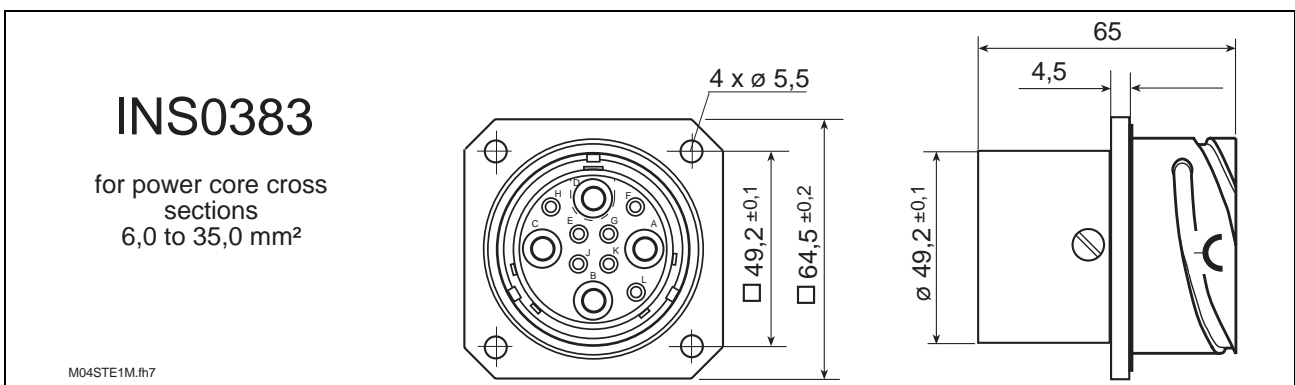


Fig. 2-59: INS0383 Flanged socket bushings

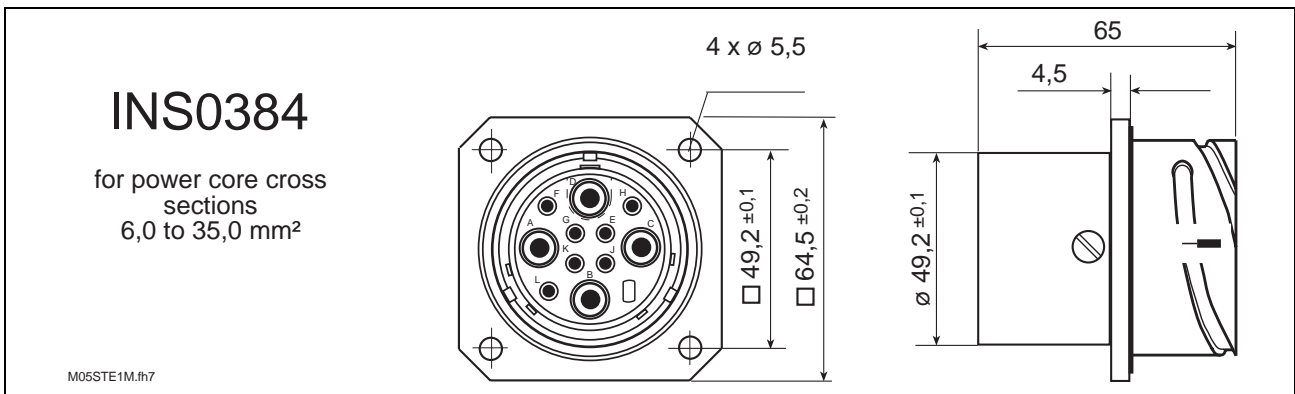


Fig. 2-60: INS0384 Flanged socket pins

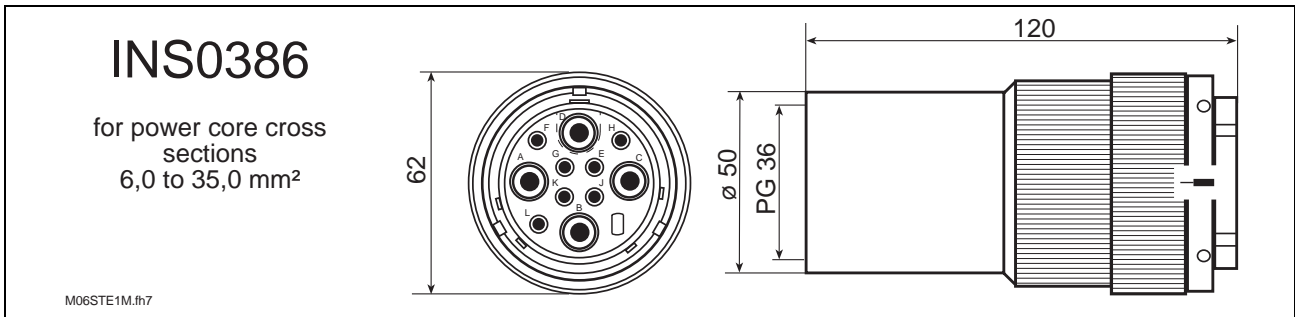


Fig. 2-61: INS0386 Connector pins

2.3.1 Contacts

	Contacts		Cross section in mm ²	No.	How mounted	Removal
INS0380/C06	power	(Crimp bushing)	6.0	3	not needed	Fig. 2-67
	ground	(Crimp bushing)	6.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0380/C10	power	(Crimp bushing)	10.0	3		Fig. 2-67
	ground	(Crimp bushing)	10.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0380/C16	power	(Crimp bushing)	16.0	3		Fig. 2-67
	ground	(Crimp bushing)	16.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0380/C25	power	(Crimp bushing)	25.0	3	Fig. 2-67	
	ground	(Crimp bushing)	25.0	1	not needed	
	control	(Crimp bushing)	1.5	7	Fig. 2-68	
INS0380/L35	power	(soldering bushing)	35.0	3	Fig. 2-67	
	ground	(soldering bushing)	35.0	1	not needed	
	control	(soldering bushing)	1.5	7	Fig. 2-68	
INS0381/C06	power	(Crimp bushing)	6.0	3	Fig. 2-67	
	ground	(Crimp bushing)	6.0	1	not needed	
	control	(Crimp bushing)	1.5	7	Fig. 2-68	

Continued on next page

	Contacts		Cross section in mm ²	No.	Mounting	Removal
INS0381/C10	power	(Crimp bushing)	10.0	3	not needed	Fig. 2-67
	ground	(Crimp bushing)	10.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0381/C16	power	(Crimp bushing)	16.0	3		Fig. 2-67
	ground	(Crimp bushing)	16.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0381/C25	power	(Crimp bushing)	25.0	3		Fig. 2-67
	ground	(Crimp bushing)	25.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0381/L35	power	(soldering bushing)	35.0	3		Fig. 2-67
	ground	(soldering bushing)	35.0	1		not needed
	control	(soldering bushing)	1.5	7		Fig. 2-68
INS0382/C06	power	(Crimp bushing)	6.0	3		Fig. 2-67
	ground	(Crimp bushing)	6.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0382/C10	power	(Crimp bushing)	10.0	3		Fig. 2-67
	ground	(Crimp bushing)	10.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0382/C16	power	(Crimp bushing)	16.0	3		Fig. 2-67
	ground	(Crimp bushing)	16.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0382/C25	power	(Crimp bushing)	25.0	3	Fig. 2-67	
	ground	(Crimp bushing)	25.0	1	not needed	
	control	(Crimp bushing)	1.5	7	Fig. 2-68	
INS0382/L35	power	(soldering bushing)	35.0	3	Fig. 2-67	
	ground	(soldering bushing)	35.0	1	not needed	
	control	(soldering bushing)	1.5	7	Fig. 2-68	
INS0383/C06	power	(Crimp bushing)	6.0	3	Fig. 2-67	
	ground	(Crimp bushing)	6.0	1	not needed	
	control	(Crimp bushing)	1.5	7	Fig. 2-68	
INS0383/C10	power	(Crimp bushing)	10.0	3	Fig. 2-67	
	ground	(Crimp bushing)	10.0	1	not needed	
	control	(Crimp bushing)	1.5	7	Fig. 2-68	
INS0383/C16	power	(Crimp bushing)	16.0	3	Fig. 2-67	
	ground	(Crimp bushing)	16.0	1	not needed	
	control	(Crimp bushing)	1.5	7	Fig. 2-68	
INS0383/C25	power	(Crimp bushing)	25.0	3	Fig. 2-67	
	ground	(Crimp bushing)	25.0	1	not needed	
	control	(Crimp bushing)	1.5	7	Fig. 2-68	
INS0383/L35	power	(soldering bushing)	35.0	3	Fig. 2-67	
	ground	(soldering bushing)	35.0	1	not needed	
	control	(soldering bushing)	1.5	7	Fig. 2-68	
INS0384/C06	power	(Crimp bushing)	6.0	3	Fig. 2-67	
	ground	(Crimp bushing)	6.0	1	not needed	
	control	(Crimp bushing)	1.5	7	Fig. 2-68	

Continued on next page

	Contacts		Cross section in mm ²	No.	Mounting	Removal
INS0384/C10	power	(Crimp bushing)	10.0	3	not needed	Fig. 2-67
	ground	(Crimp bushing)	10.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0384/C16	power	(Crimp bushing)	16.0	3		Fig. 2-67
	ground	(Crimp bushing)	16.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0384/C25	power	(Crimp bushing)	25.0	3		Fig. 2-67
	ground	(Crimp bushing)	25.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0384/L35	power	(soldering bushing)	35.0	3		Fig. 2-67
	ground	(soldering bushing)	35.0	1		not needed
	control	(soldering bushing)	1.5	7		Fig. 2-68
INS0386/C06	power	(Crimp bushing)	6.0	3		Fig. 2-67
	ground	(Crimp bushing)	6.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0386/C10	power	(Crimp bushing)	10.0	3		Fig. 2-67
	ground	(soldering bushing)	10.0	1		not needed
	control	(soldering bushing)	1.5	7		Fig. 2-68
INS0386/C16	power	(Crimp bushing)	16.0	3		Fig. 2-67
	ground	(Crimp bushing)	16.0	1		not needed
	control	(Crimp bushing)	1.5	7		Fig. 2-68
INS0386/L25	power	(soldering bushing)	25.0	3	Fig. 2-67	
	ground	(soldering bushing)	25.0	1	not needed	
	control	(soldering bushing)	1.5	7	Fig. 2-68	
INS0386/C35	power	(Crimp bushing)	35.0	3	Fig. 2-67	
	ground	(Crimp bushing)	35.0	1	not needed	
	control	(Crimp bushing)	1.5	7	Fig. 2-68	

Fig. 2-62: Overview of contacts INS0380 to 0386

2.3.2 Crimping tool

Crimping tool for power contacts

The power contacts for connector size III cannot be crimped with conventional or pneumatic tools. Due to the high deformation resistance of the contacts it is necessary to use hydraulic tools. These are either electric or manual. The crimp head with the relevant crimp cheek is the same for all applications.

The units are designed for an operating pressure of 6250 N/cm² (625 bar).

Operating temperature may not exceed -15°C to + 80°C.

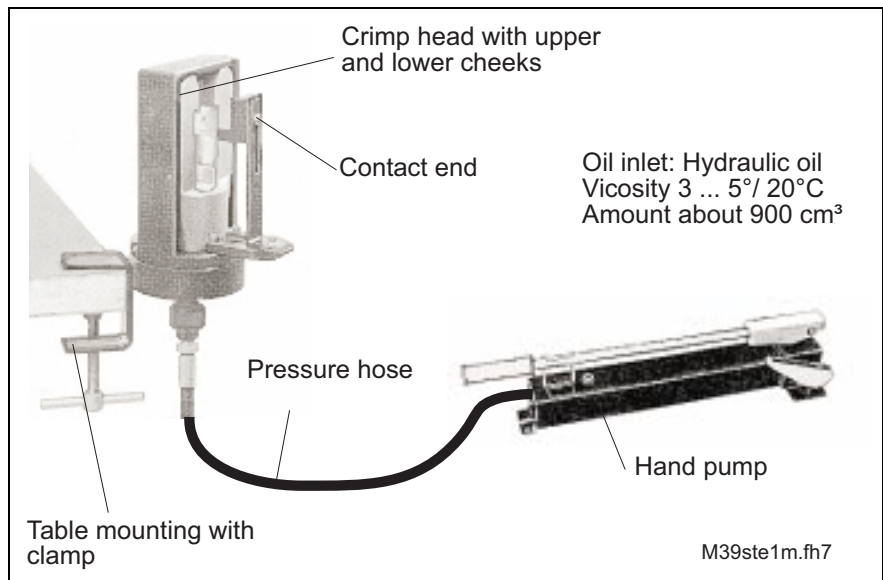


Fig. 2-63: Crimping tool for power contacts INS0380 to INS0386

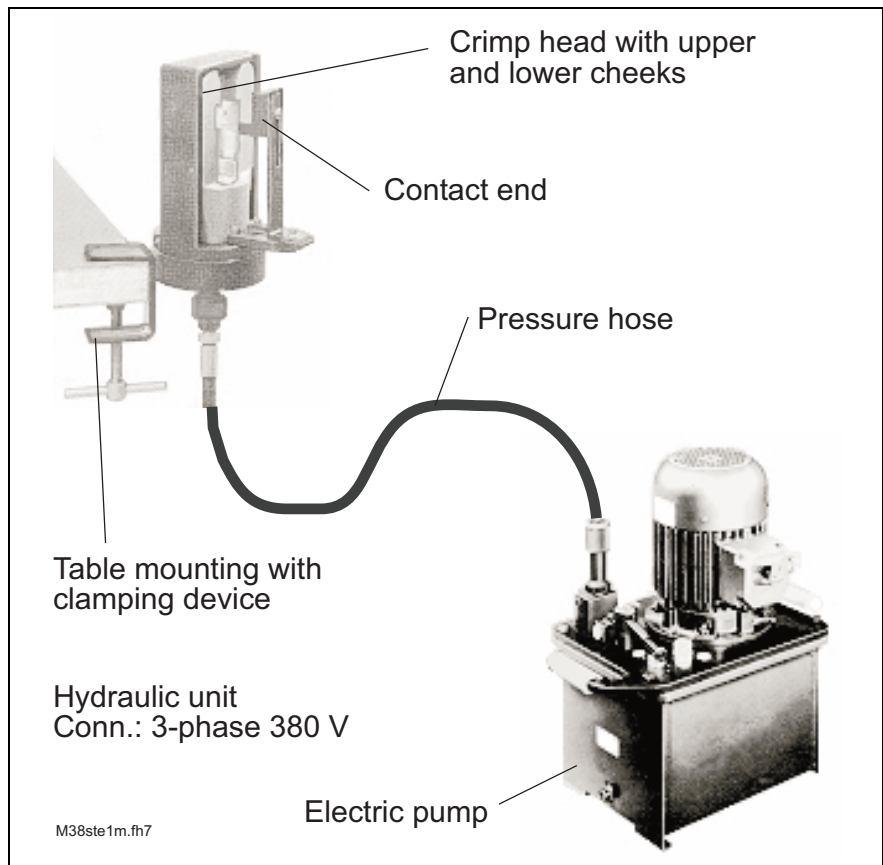


Fig. 2-64: Crimping tool for power contacts INS0380 to INS0386 with hydraulic device

Crimping tool for control contacts

To crimp control contacts use the manual crimping tool. It is made up of two individual parts (see Fig. 2-65).



Fig. 2-65: Crimping tool for control contacts INS0380 to INS0386

Note: The crimping tool is identical to the tool for power and control contacts of connector size II.

The tool settings are specified below.

Contact type Control contact	Cross section	Selector setting	Color of positioner
pin	0.75 mm ²	1	red
pin	1.0 mm ²	2	red
pin	1.5 mm ²	2	red
bushing	0.75 mm ²	1	red
bushing	1.0 mm ²	2	red
bushing	1.5 mm ²	2	red

Fig. 2-66: Setting of crimping tool for INS0380 to INS0386 (control contacts)

2.3.3 Assembly tool

Mounting tool for contacts To assemble power, control and ground contacts no special tools are needed. The crimped or soldered contacts can easily be pushed from the back side into the insulation body of the connector.

Note: Push the contacts in until the audibly click into place.

2.3.4 Disassembly tools

Disassembly tools for contacts No special tools are needed here either. These tools have two half shells that are inserted from behind into the insulation body and pressed against the contact (unlocking of contact).



Fig. 2-67: Disassembly tool for power contacts INS0380 to INS0386



Fig. 2-68: Disassembly tool for control contacts INS0380 to INS0386

Removing power and control contacts

Procedure:

1. Insert disassembly tool from behind into insulation body.
2. Unlock contact and simultaneously pull contact out at litz wires.

Note: This tool is also suited to remove control contacts of connector size II.

Removing ground contacts

No special tools are needed to remove ground contacts.

Procedure:

1. Loosen ground screws.
2. Pull contact out.

2.3.5 Assembly Instructions for INS0380

The steps on making flanged socket INS0380 are described below.

Note: Use an appropriate tool to assemble the cable connections on the motor.

Stripping lengths are listed below.

Designation	Stripping lengths
power cores	12.0 mm
control strands	12.0 mm

Fig. 2-69: Stripping lengths INS0380

1. Take flanged socket apart (see Fig. 2-71).
2. Crimp pin contact as per „section 2.3.2 Crimping tool“.
3. Fit insulation body as per Fig. 2-70.
4. Mount pin contact (no special tools needed).

Core designations	Contact designation Connector size III
U	A
V	B
W	C
GN/YE	D
TM+ or T1	E
TM - or T2	H
Br+ or BR	F
Br- or 0V _B	G
empty	L

Fig. 2-70: Connection allocations INS0380 (flanged motor socket)



Fig. 2-71: Assembling INS0380

Note: Use tool to remove pin contacts (see Fig. 2-67, Fig. 2-68).

5. Place flanged socket lid back on and fix. Tightening torque of both screws is $3.1 \text{ Nm} \pm 10\%$.

Flanged socket is ready.

2.3.6 Assembly Instructions for INS0381 / INS0382 / INS0386

Power cable for Connector size III Dismantling and stripping lengths are listed below.

Designation	Dismantling length	Shoulder length	Stripping length
external mantle	95 mm	---	---
power cores 1,2,3	---	Shorten to 70 mm	12.0 mm
protective conductor GNYE	---	65 mm	12.0 mm
control strands	---	95 mm	12.0 mm
shield connecting litz wires	---	95 mm	12.0 mm

Fig. 2-72: Dismantling, shoulder and stripping lengths of power cable INS0381, -0382, -0386

Note: The conduit threads needed (and possibly the reductions) are not part of the overall delivery. The conduit thread sizes and the reductions must be selected as per the cable diameter and the conduit thread of the end housing.

1. Take connector apart (see Fig. 2-73).

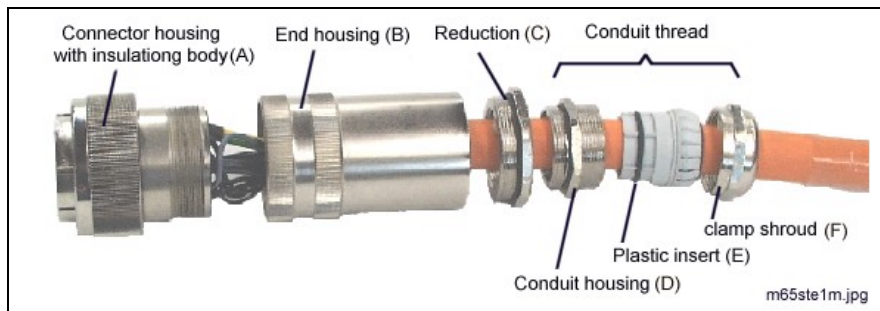


Fig. 2-73: Individual parts of connector INS0381, -0382, -0386

2. Cable clamp (clamp shroud (F), plastic insert (E), conduit thread (D) and possible reduction (C)) as per cable external diameter and end housing must be pushed over the cable.
3. Push shrink sleeve (G), length 30mm, over outside cable mantle.
4. Dismantle cable, comb out total shield, fold back over outside mantle and fix with tape.
5. Push sleeve (H) 10 mm over strand bundle and shrink with hot air.
6. All foils must be removed and cut off flush with textile fibers at shrink sleeve (H).

7. Comb out intertwining of strand pair and lay bare filler litz wires.
8. Twist litz wires of strand pair (especiall shield intertwining) with each other.

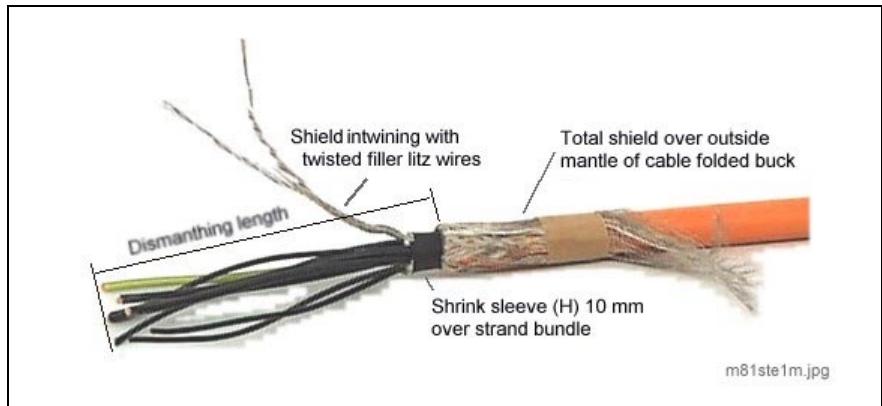


Fig. 2-74: Making power cables for INS0381, -0382, -0386

9. Remaining strand pair intertwining must be cut off flush at shrink sleeve (H).
10. With shield intertwining re-inforced filler litz wires must be shorted by about 10 mm and soldered to grey litz wires (length of litzs 80 mm, cross section 1.0 mm²).
11. Secure soldering of litz wires with shrink sleeve (about 17 mm).
12. Strip and dismantle strands as per Fig. 2-72.

Crimping contacts

13. Crimp power and control contacts with crimping tool (see 2.3.2 Crimping tool). Note settings of crimping tool!

Soldering contacts

Note: The contacts can also be soldered

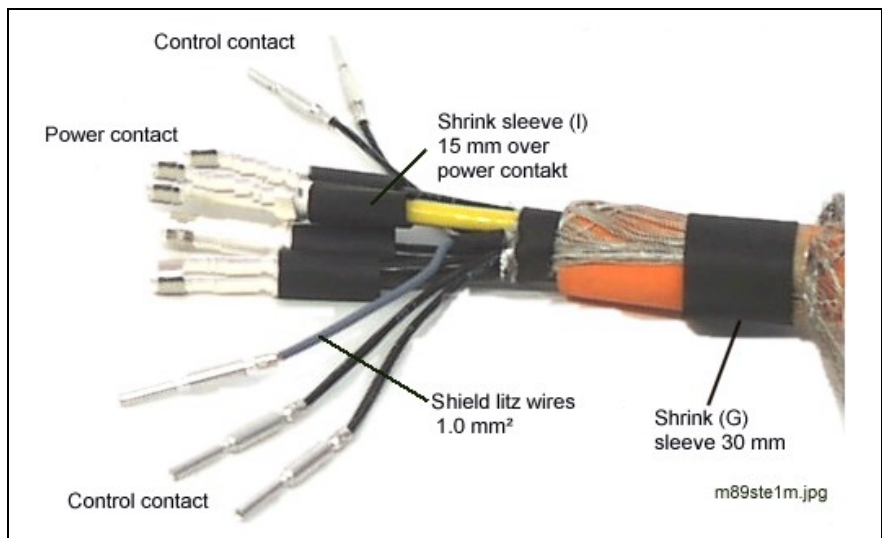


Fig. 2-75: Making contacts INS0381, -0382, -0386

14. Pull shrink sleeve (I) over contacts, length 15mm. Note that the shrink sleeve should only cover the contact by about 5mm.
15. Fit appropriate contacts onto insulation body (A) per connection allocations (see Fig. 2-76). Procedure: First clip in power contacts, then control contacts.
16. Screw ground contact into insulation body (A).

Core designations	Contact designation Connector size III
1	A
2	B
3	C
GN/YE	D
5	E
6	H
7	F
8	G
shield connecting litz wires (gray)	L

Fig. 2-76: Connection allocations for INS0381, -0382, -0386

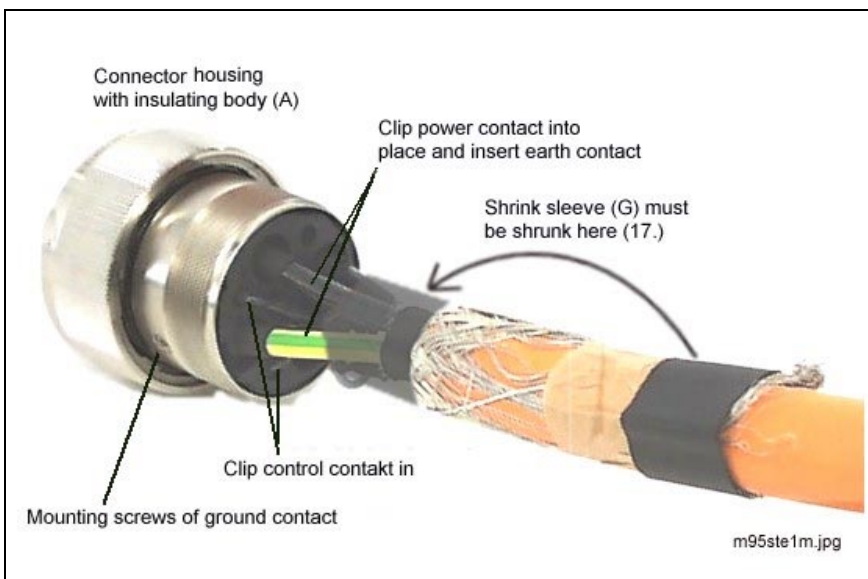


Fig. 2-77: Fitting insulation body INS0381, -0382, -0386

Note: No special tools need to insert contacts!

17. Push shrink sleeve (G), length 30mm, over entire strand bundle and shrink.
18. Screw end housing (B) onto connector housing (A).

Note: The connector or coupling housing have to fixed into place when screwing.

Recommendation: Insert connector onto flanged socket or insert coupling.

Protection category IP67: To ensure this all the individual parts must be completely screwed into place!

19. Screw conduit thread (D) into end housing (B) and tighten with fork wrench a (use reduction (C) if needed).

20. Remove fixing of shield intertwining and insert plastic insert (E) into conduit thread (D). Place shield intertwining over plastic insert.

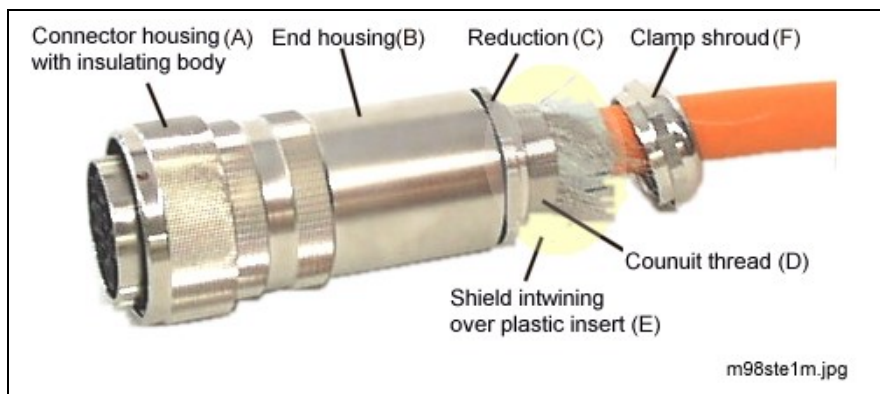


Fig. 2-78: Assembling conduit housing plastic insert for INS0381, -0382, -0386

21. Cut excessive shield intertwining off at conduit thread (D) and screw conduit thread onto clamp shroud.

22. Screw conduit thread (D) and clamp shroud (F) on with fork wrench.



Fig. 2-79: Assembling clamp shroud for INS0381, -0382, -0386

The connector is ready!

2.3.7 Assembly Instructions for INS0383 / INS0384

The steps on making flanged socket INS0383 / INS0384 are described below.

Note: Use an appropriate tool to assemble the cable connections on the motor.

Stripping lengths are listed below.

Designation	Stripping lengths
power cores	12.0 mm
control strands and shield connecting litz wires	12.0 mm

Fig. 2-80: Stripping lengths INS0383 / INS0384

1. Crimp contacts as per „section 2.3.2 Crimping tool“.
2. Fit insulation body as Fig. 2-81.
3. Assembly contacts (no special tools needed).

Core designations	Contact designation Connector size III
1	A
2	B
3	C
GN/YE	D
5	E
6	H
7	F
8	G
shield connecting litz wires (gray)	L

Fig. 2-81: Connection allocations INS0383 / INS0384

Note: Use tool to remove contacts (see Fig. 2-67, Fig. 2-68).

The flanged socket is ready.

3 Assembly Instructions for Motors with Terminal Box

3.1 Assembly Instructions for MKDs

The procedure on assembling the cable connections on the motor are described below.

Note: Use suitable tools when assembling motor connections.

Connector plugs X1 and X2 for the power cable as well as connector X3 for the feedback cable must be connected to the strands of the cable as specified in the diagram in the Motor Project Planning Manual (DOK-MOTOR*-MKD*****-PR05-DE-P).

Note: The materials required (connectors X1, X2, X3 and the crimp contacts for X3 plus cable shoes to connect the shield) come with the MKD motor. The complete set of materials can also be ordered separately if so needed (order designation: **accessories kit S1-MKD**).

Power cable Stripping lengths are specified in the table below.

Designation	Dismantling length	Stripping length
External mantle	90 mm	---
Litz wires for X1 and X2	---	7 mm

Fig. 3-1: Stripping lengths of MKD power cable

1. Dismantle power cable.
2. Fold complete shield back (over external mantle of cable).

Note: Do not remove foil tape of core pairs 5/6 or 7/8 !

3. Push a 5 mm long shrink sleeve over core pairs 5/6 or 7/8 which are wrapped in foil.
4. Shrink the sleeve using hot air.
5. Cut the foil tape and the shield off flush at the shrink sleeve and then pull another 8 mm of the sleeve over this.
6. Shrink the sleeve with hot air.

Note: Use sufficient shrink sleeve material !

7. Comb out the entire shield.
8. Twist parts of the total shield with filler litz wires; coat them with tin and cut them off (maximum length of 5mm).
9. Solder on litz wires (length of litz 70 mm; cross section 0.75 mm²).
10. Pull shrink sleeve over soldering location and shrink using hot air.
11. Pull sleeve over end of mantle (length 13mm) (projecting 5 mm length over outside cable mantle) and shrink.
12. Strip individual strands.
13. Mount ferrules as per core cross section and attach connectors X1 and X2 as well as the ring terminals to connect the shield.

The power cable is now ready.

Feedback cable Stripping lengths are specified in the table below.

Designation	Dismantling length	Stripping length
External mantle	90 mm	---
Litz wires for X3	---	3 mm

Fig. 3-2: Stripping lengths for MKD feedback cables

1. Dismantle feedback cable.
2. Comb out entire shield.
3. Twist parts of shield with filler litz wires, tin coat them and cut off (length max. 5mm).
4. Solder litz wires on (litz length 70 mm; cross section 0.5 mm²).
5. Pull shrink sleeve over soldered location and shrink with hot air.
6. Pull sleeve over end of mantle (length 13mm) (projecting 5 mm length over outside cable mantle) and shrink.

Note: Use sufficient shrink sleeve material !

Use a hand crimp tool (see Fig. 3-3) to prepare the crimp contacts for connector X3.



Fig. 3-3: Hand crimp tools for an MKD

7. Strip individual strands.
8. Put crimp contacts for X3 into positioner, see Fig. 3-3.
9. With tools completely open, clap the positioner, feed the litz wire through from the opposite side and then crimp the contact.
10. Insert contact as shown in diagram (see MKD project planning manual for detailed description) into connector X3 (note the position of the snap-in nose !).

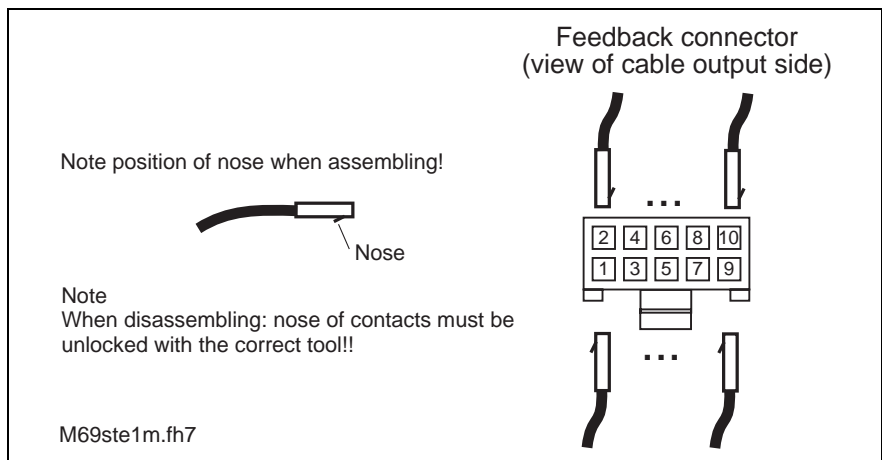


Fig. 3-4: Assembling an MKD feedback connector

11. Connect ring terminals for the shield.

Feedback connections are ready.

3.2 Assembly Instructions for an MKE

The following are the assembly steps for the cable connections on the motor.

Note: Use suitable tools when assembling motor connections.

Connector plugs X1 and X2 for the power cable and connector plug X3 for the feedback cable must be connected to the strands of the cable as specified in the diagram in the project planning manual of the motor (see DOK-MOTOR*-MKE*****-PRJ1-EN-P).

Note: The connector materials (plugs X1, X2, X3 plus the crimp contacts for X3 and the ring terminals for connecting the shield) come with the MKD motor. The complete set of accessories, however, can be ordered separately if needed.

Order designations:

SUP-M01-MKE035 for MKE035 and MKE045

SUP-M01-MKE096 for MKE096

Power cables The dismantling or stripping lengths are specified in the table below.

Designation	Dismantling length	Stripping length
External mantle	90 mm	---
Litz wires for X1 and X2	---	7 mm

Fig. 3-5: Dismantling lengths of the MKE power cables

1. Push the Exxd screws over the cable mantle.
2. Dismantle the power cable.
3. Fold the entire shield back (over the external cable mantle).

Note: Do not remove the foil tape over the core pairs 5/6 or 7/8 !

4. Push a 5 mm long shrink sleeve over core pairs 5/6 or 7/8 which are wrapped in foil tape.
5. Shrink the sleeve using hot air.
6. Cut both the foil tape and the shield intertwining off flush at the shrink sleeve and pull another 8 mm of the shrink sleeve over this again.

7. Shrink the sleeve using hot air.

Note: Use sufficient shrink sleeve material !

8. Comb out the entire shield.
9. Twist parts of shield with filler litz wires, tin coat them and cut off (length max. 5mm).
10. Solder litz wires on (litz length 70 mm; cross section 0.75 mm²).
11. Pull shrink sleeve over soldered location and shrink with hot air.
12. Pull shrink sleeve over mantle end (length 13 mm) (projecting 5 mm length over outside cable mantle) and shrink.
13. Strip individual strands.
14. Mount ferrules as per core cross section and attach connectors X1 and X2 as well as the ring terminals to connect the shield.

The power connection is now ready.

Feedback cable The dismantling or stripping lengths are specified in the table below.

Designation	Dismantling length	Stripping length
External mantle	90 mm	---
Litz wires for X3	---	3 mm

Fig. 3-6: Dismantling length of MKE feedback cables

1. Dismantle feedback cable.
2. Comb out entire shield.
3. Twist parts of shield with filler litz wires, tin coat them and cut off (length max. 5mm).
4. Solder litz wires on (litz length 70 mm, cross section 0.75 mm²).
5. Pull shrink sleeve over soldering location and shrink with hot air.
6. Pull shrink sleeve over mantle end (length 13 mm) (projecting 5 mm length over outside cable mantle) and shrink.

Note: Use sufficient shrink sleeve material !

Use a hand crimp tool (see Fig. 3-3) to prepare the crimp contacts for connector X3.



Fig. 3-7: Hand crimp tools for MKE

7. Strip individual strands.
8. Put crimp contacts for X3 into positioner, see Fig. 3-3.
9. With tools completely open, clasp the positioner, feed the litz wire through from the opposite site and the crimp the contact.
10. Insert contact as shown in diagram (see DOK-MOTOR*-MKE*****-PRJ1-EN-P) into X3 (note position of nose !)

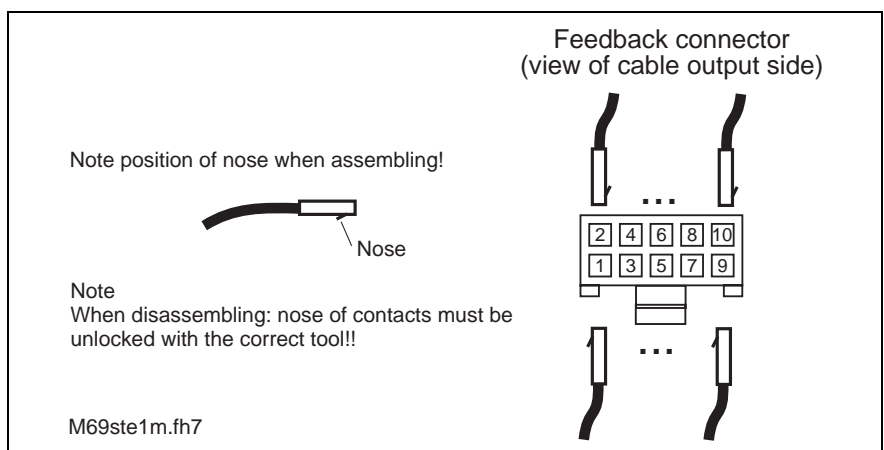
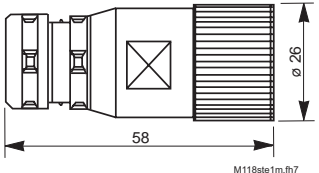
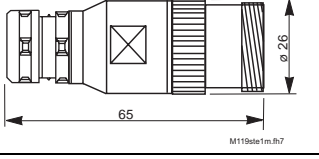
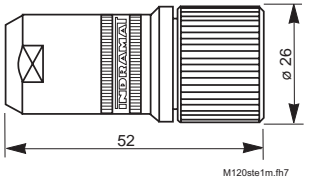
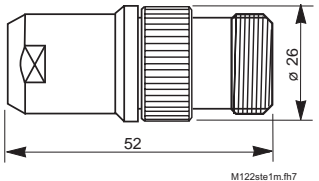
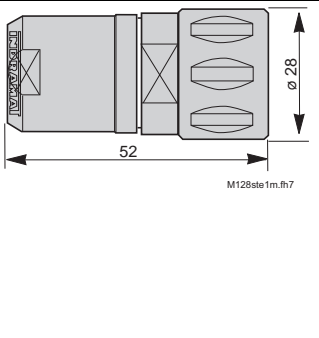
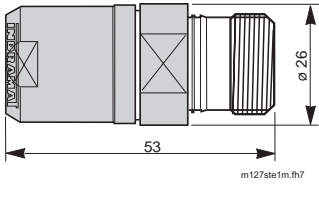
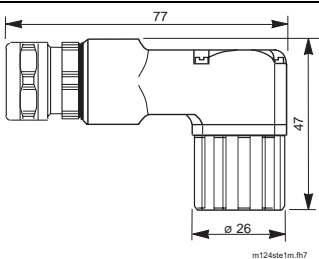


Fig. 3-8: Assembling an MKE feedback connector

11. Connect ring terminals to shield.

The feedback connection is ready.

4 Signal Plug-In Connectors

Type	Code	Pole Code	Contact		View	How to make see
			Type	No.		
INS0512/L	80°/120°	E	bushing	12		Section 4.3
INS0515/L	80°/120°	P	pin	12		Section 4.3
INS0513/C INS0513/L INS0517/C	80°/120° 80°/120° 0°/80°/120°	E E P	bushing bushing pin	12 12 12		Section 4.4
INS0516/C INS0516/L INS0614/L	80°/120° 80°/120° 0°	P P P	pin pin pin	12 12 12		Section 4.4
INS0379/C INS0461/C INS0488/C INS0492/C INS0493/C INS0498/C INS0639/C INS0713/C INS0717/C	0° 0° 0° 0° / Pin 1 0° / Pin 7 20° 0° 80° / 120° 0°/80°/120°	P P E E E P E E P	bushing pin pin bushing bushing bushing bushing bushing pin	17 17 12 12 12 12 12 12 12		Section 4.4
INS0451/C INS0494/C INS0495/C INS0496/C INS0643/C INS0716/C	0° 0° / Pin 1 0° / Pin 7 0° 0° 80° / 120°	P P P P E P	bushing pin pin pin pin pin	12 12 12 12 17 12		Section 4.4
INS0510/C INS0510/L	80°/120° 80°/120°	E E	bushing bushing	12 12		Section 4.5
Continued on next page						

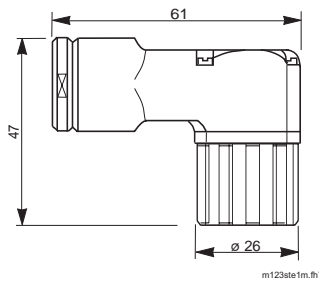
Type	Code	Pole Code	Contact		View	How to make see
			Type	Number		
INS0511/C	80°/120°	E	bushing	12		Section 4.5
INS0511/L	80°/120°	E	bushing	12		

Fig. 4-1: Overview feedback connector

4.1 Crimping tools for Signal Plug-In Connector

Manual crimping tool with contact positioner

Using this manual crimping tool it is possible to strike bushings and pin contacts for cable cross sections 0.14²; 0.25²; 0.5² and 1.0². There is a contact positioner at the top of the crimping tool which is fixed into place and cannot be manipulated. Using this setting it is possible to position pin and bushing contacts.

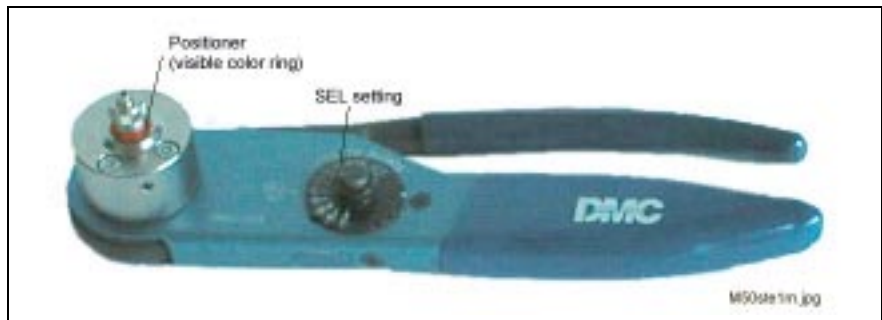


Fig. 4-2: Manual crimping tool for feedback contact

Manual crimping tool setting.

The selector setting (SEL setting) on the handle of the crimping tool is used to set to the desired cable cross section.

The SEL settings (1-8) apply to:

Connection cross section [mm ²]	SEL setting
0.14	2
0.25	2
0.5	4
1.0	5

Fig. 4-3: Selector setting of manual crimping tool

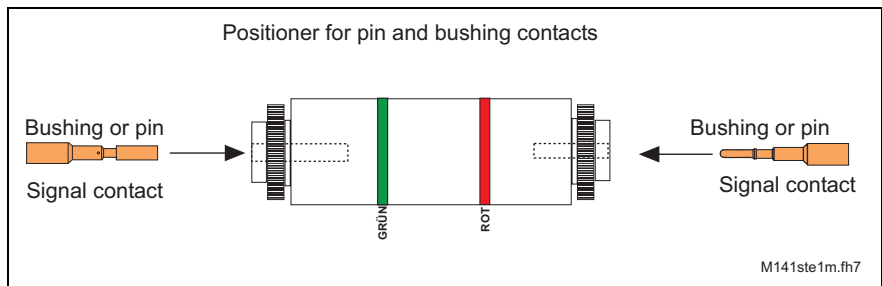


Fig. 4-4: Contact positioner for feedback contact

Color coding of the positioner:

If the positioner has been correctly mounted into the manual crimping tool or the pneumatic crimping tool, then the color codes display

- Red** Setting for contacts for the standard insulation body.
- Green** Setting for contacts for the separate insulation body.

Pneumatic crimping tool Pneumatic crimping tool for a higher number of pieces.

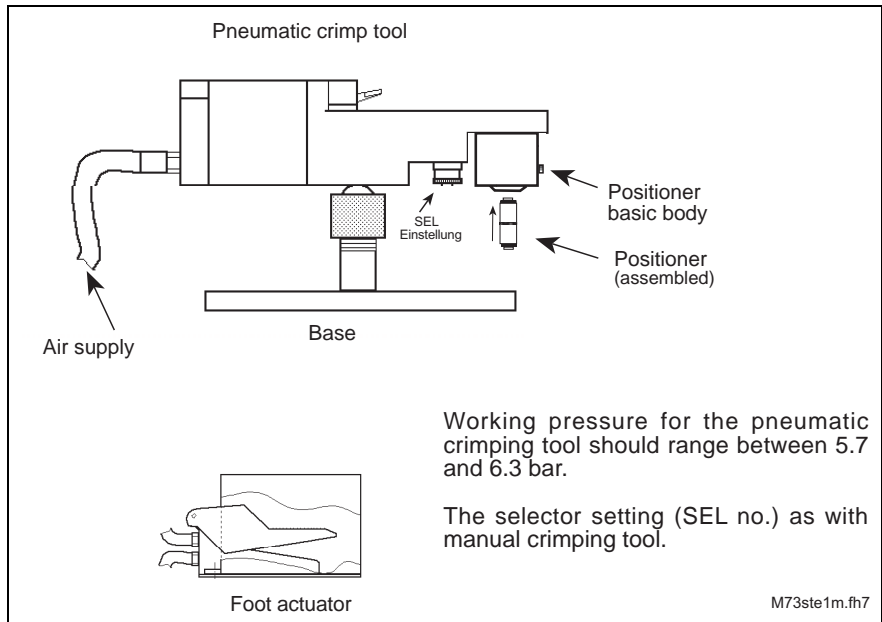


Fig. 4-5: Pneumatic crimping tool

Note: The tool must be ordered by listing the material numbers of each part (see order designations).

4.2 Disassembly Tool for Signal Plug-In Connectors

Using the following tools it is possible to remove the contacts of the plug-in connectors from the insulation bodies and then to remove these from the plug-in connector housing.


Disassembly Tool	required for connector type
 <p data-bbox="654 577 917 598">can be used for contacts</p>	<p data-bbox="1021 474 1420 577">INS0513/C, INS0517/C, INS0516/C, INS0379/C, INS0461/C, INS0716/C, INS0451/C, INS0511/C, INS0717/C, INS0713/C, INS0510/C</p>

Fig. 4-6: Disassembly tool - feedback contact


Disassembly Tool	required for flange socket
 <p data-bbox="614 835 957 857">can be used for insulation body</p>	<p data-bbox="1021 714 1412 739">INS0458/C, INS0514/C, INS0524/C</p>

Fig. 4-7: Disassembly tool - insulation body


Disassembly Tool	required for flange socket
 <p data-bbox="598 1104 973 1151">can be used for separate insulation body</p>	<p data-bbox="1021 974 1276 999">INS0613/C, INS0629/C</p>

Fig. 4-8: Disassembly tool - insulation body

4.3 Feedback connector (straight) with conduit threads

Feedback cable The mantle removal and stripping lengths are specified in the following table:

Designation	Mantle removal length	Stripping length
External mantle	20 mm	---
Control core	---	2.0 mm

Fig. 4-9: Mantle removal and stripping lengths of feedback cables

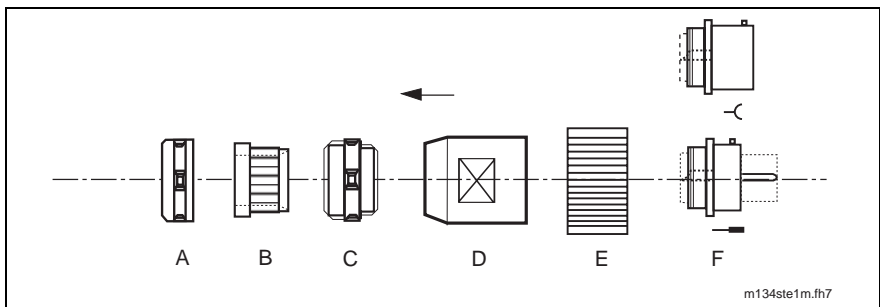


Fig. 4-10: Individual feedback connector parts

1. Take connector apart completely (see Fig. 4-10). A special tool is needed for disassembly.

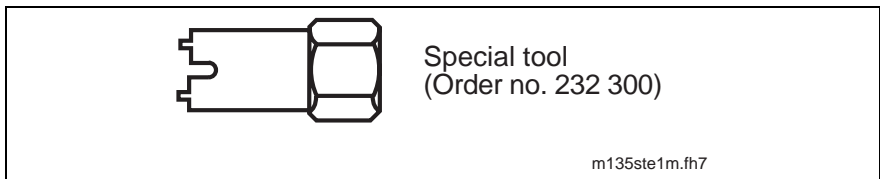


Fig. 4-11: Special tool

2. Parts A, and B of the conduit thread must be pushed over the cable in that order which is specified.

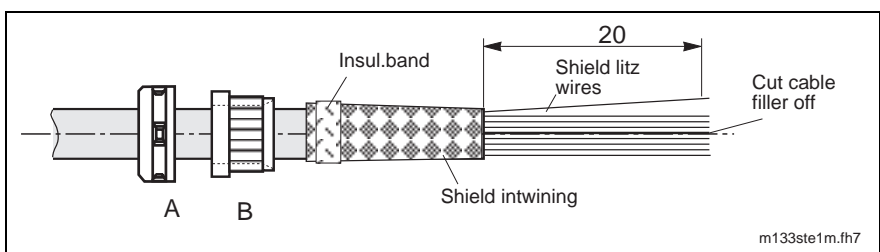


Fig. 4-12: Feedback cable mantle removal

3. Feedback cable mantle removal (for lengths see Fig. 4-9). Comb out the entire shield, pull back over external cable mantle and fix it into place with tape.
4. Remove plastic band and cut off cable filler.
5. Pull shrinking sleeve over filler litz wires of shield (15 mm length) and then shrink with hot air.

6. Place filter litz wires of shield in with the strands and then push both part C and the conduit thread as well as connector housing D over the cable.
7. Screw connector housing D onto part C. Tightening torque equals 7 to 8 Nm.

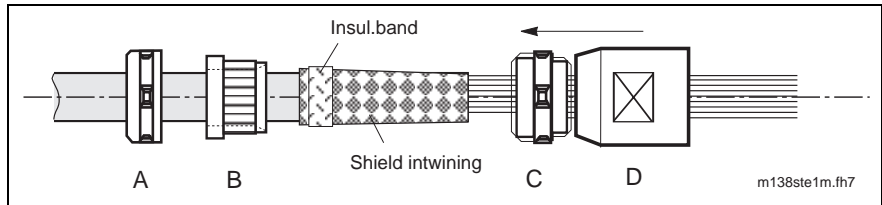


Fig. 4-13: Assembling the connector housing

8. Strip all strands by about 2 mm.
9. Tin coat all strands and the litz wires of the shield.
10. Insert a flange socket that fits the connector and screw lightly into place using knurled nut E.

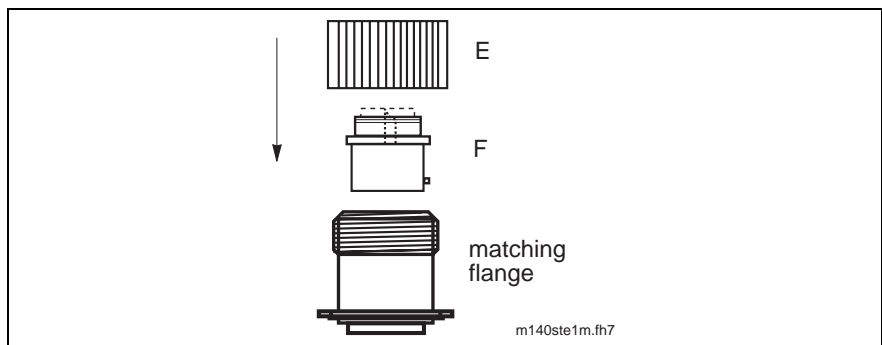


Fig. 4-14: Assembly aids

11. Mount connector part F onto the flange socket and screw lightly into place using knurled nut E.
12. Tin coat the soldered points in connector part F.
13. Shrink sleeves (lengths of 9 mm) must be pushed over the strands and the litz wires of the shield.
14. Solder strands and litz wires of shield into connector part F (start in the center of the connector with no.: 10, 11, 12 and so on).

Note: Push the shrink sleeve over the new soldering spot after each soldering. Pin assignment is specified in the terminal connecting plan.

15. Shrink the sleeves using hot air.
16. Using the special tool (mat. No. 232300) and screwdriver (SW22) screw insulation body F onto connector housing D. Tightening torque equals about 3 to 4 Nm (see Fig. 4-15, step 1).

17. Push plastic clamp B into part C (press parts D/E against it) and screw A lightly into place.

Note: Make sure that the shield intertwining surrounds the external cable mantle evenly. When pressing clamp B into part C make sure that the intertwining is not pushed into connector housing D by mistake.

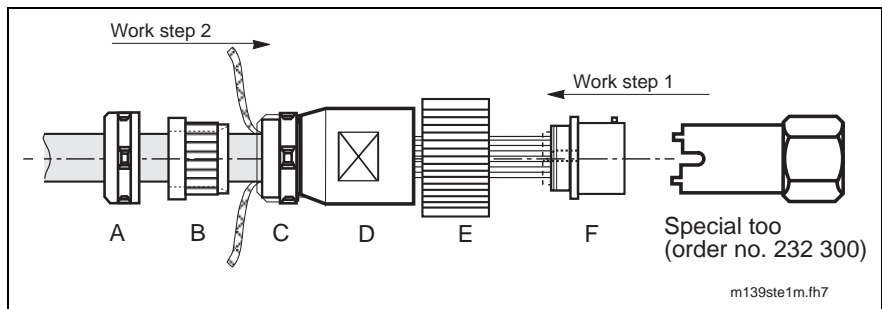


Fig. 4-15: Assembling insulation body and shield connection

18. Cut excessive shield intertwining off at part B.
19. Screw parts A and D of the conduit thread on with a tightening torque of about 7 to 8 Nm (see Fig. 4-15, step 2).

The connector is now ready!

4.4 Feedback connector (straight) with integral cable clamp

Feedback cable The mantle removal and stripping lengths are listed below.

Designation	Mantle removal length		Stripping length	
	Solder	Crimp	Solder	Crimp
External mantle	30 mm	30 mm	---	---
Control strands	---	---	2.0 mm	4.0

Fig. 4-16: Mantle removal and stripping lengths of feedback cables

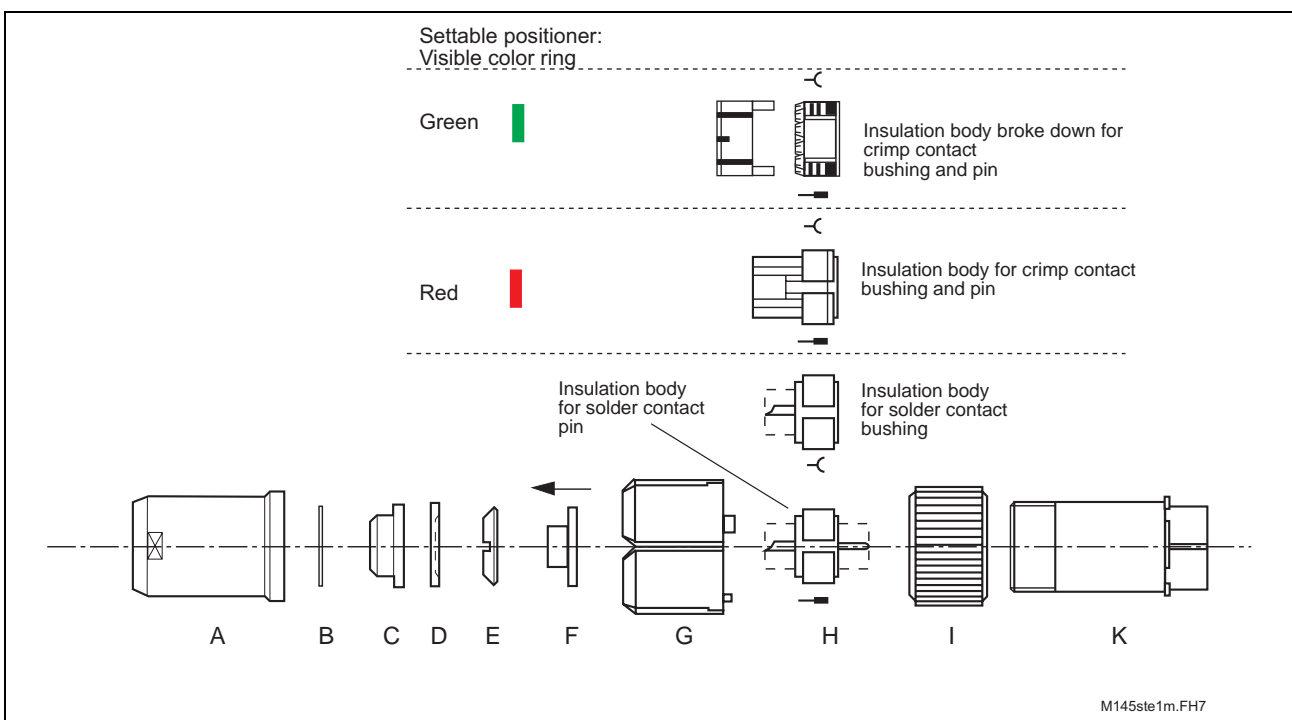


Fig. 4-17: Individual feedback connector parts

1. Take connector completely apart (see Fig. 4-17). A special tool is needed for disassembly.

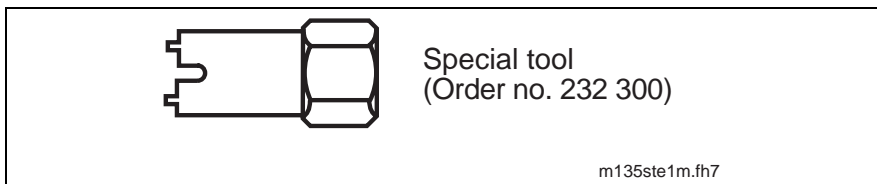


Fig. 4-18: Special tool

2. Push parts A,B,C,D and E over the cable in the order specified.

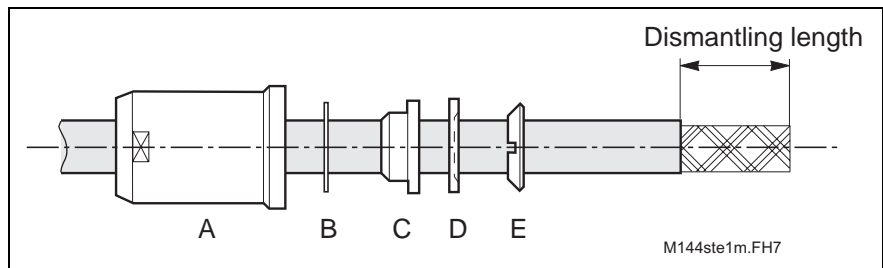


Fig. 4-19: Feedback cable mantle removal

3. Remove the mantle of the feedback cable, (for lengths see Fig. 4-16). Comb out shield, fold back over external mantle of cable and fix into place with tape.
4. Remove plastic band and cut cable fillers off.
5. Expose filler litz wires of shield and pull shrinking sleeve (length 15mm) over them and shrink with hot air.
6. Feed filler litz wires of shield and strand bundle through shield end piece F and push under the shield intertwining (see Fig. 4-20).

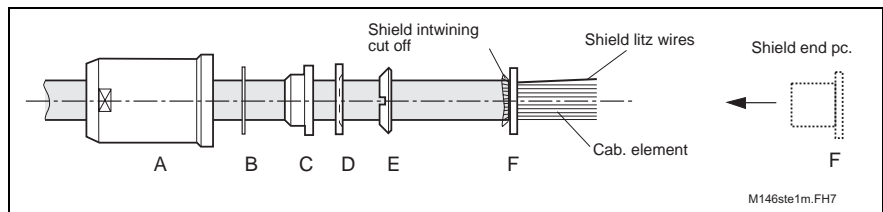


Fig. 4-20: Assembling end piece of shield

7. Cut shield intertwining off flush with cable mantle.

i There are two types of feedback connectors. The shield connection is different in each one. Feedback connectors with shield end piece (metal) feed their shields over the connector housing and an internal contact. Feedback connectors with shield end piece (plastic) feed their shield over an internal contact only.

Note: The intertwining of plastic shield end pieces may not have any contact with the connector housing. Make sure all is cut off flush!

The steps as of this point depend on the contact. Proceed **either** in accordance with section „making soldering contacts“ **or** „making crimp contacts“.

After the contacts have been connected (solder or crimp types) the next connector assembly steps are described in section „final assembly of solder or crimp types“.

Making solder contacts

- a) Cut cable fillers off and strip strands as described in Fig. 4-16.
- b) Push shrink sleeve (25 mm) over the filler litz wires of the shield and shrink with hot air.

- c) All strands and filler litz wires of the shield must be tin-coated.
- d) Tin coat soldered connections in connector part H.
- e) Pull shrink sleeve (9 mm) over individual strands and filler litz wires of the shield.
- f) Solder strands and litz wires into connector part H (start in the center of the connector with no.: 10, 11, 12 and so on).

Note: Push the shrink sleeve over the new soldering spot after each soldering. Pin assignment is specified in the terminal connecting plan.

- g) Shrink sleeves with hot air.

Note: Remove all cut off or loose litz wire rests from connector.

Making crimp contacts

- a) Cut cable filler off and strip strands as per Fig. 4-16.
- b) Push shrink sleeve (25 mm) over litz wires of shield and shrink with hot air.

Note: The sleeve may not cover the crimped area.

- c) Crimp contacts with the appropriate tool (see Section 4.1 Crimping tools for Signal Plug-In Connector). Insert positioner into crimping tool depending on whether contacts or insulation body.
- d) Fit insulation body as per terminal connection plan (see Project planning manual of motor).

Note: Remove all cut off or loose litz wire rests from connector.

Final assembly of solder/crimp types

- 8. Press part E onto end of shield.

Note: The intertwining of the shield may not stick out!

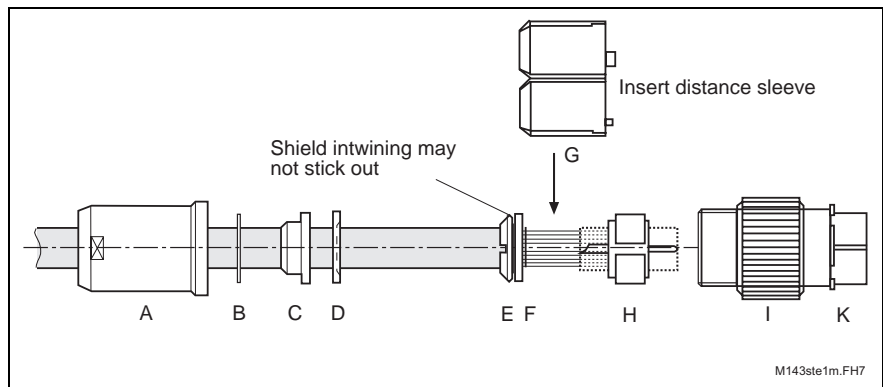


Fig. 4-21: Assembling the feedback connector

9. Assemble and place distance sleeve G between parts E, F and the insulation body H and insert complete into connector housing K.
10. Push parts B, C and D onto section E.
11. Screw end housing A and connector housing K with special tool (mat. no.: 232300). Tightening torque equals about 5 to 6 Nm.

The connector is now ready!

4.5 Feedback connector (angled) with conduit threads

Feedback cable Mantle removal and stripping lengths are listed below.

Designation	Mantle removal length	Stripping length
External mantle	55 mm	---
Control strands	---	2.0 mm

Fig. 4-22: Dismantling and stripping lengths of feedback cable

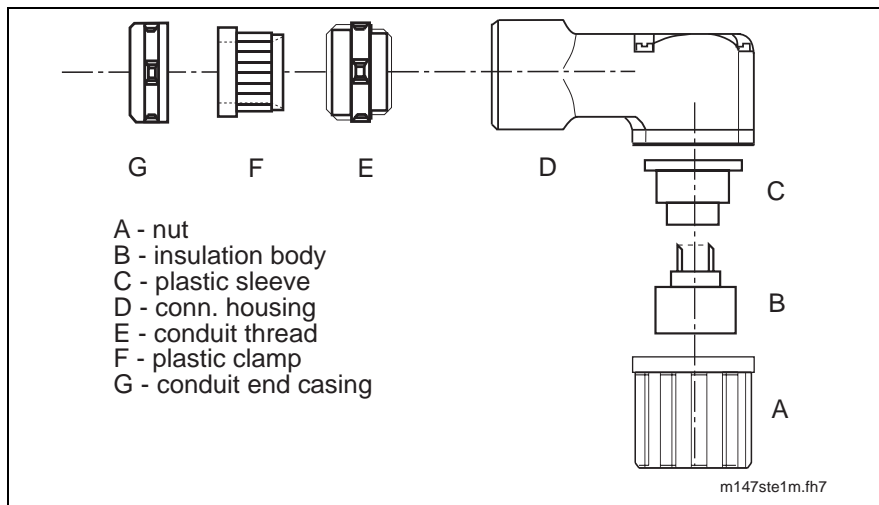


Fig. 4-23: Individual feedback connector parts

1. Take connector apart (see Fig. 4-23).
2. Push parts G, F, E and D over the cable in the order specified.
3. Remove mantle of feedback cable (for lengths see Fig. 4-22). Comb out complete shield fold back over external cable mantle and fix into place with tape.
4. Remove plastic band and cut cable fillers off.
5. Pull shrink sleeve over filler litz wire of shield (length of 50mm) and shrink with hot air.
6. Strip all strands (stripping length see Fig. 4-22).
7. Tin coat all strands and filler litz wires of shield.
8. Tin coat soldered spots in insulation body B.
9. Push shrink sleeves over strands (length of 9 mm) and litz wires of shield.

10. Solder strands and filler litz wires of shield onto insulation body B (in the center of the connector start with no.: 10, 11, 12).

Note: Push the shrink sleeve over the new soldering spot after each soldering. Pin assignment is specified in the terminal connecting plan.

11. Push shrink sleeves over strands and shrink with hot air.
12. Insert insulation body B and plastic sleeve C into coupling ring A.
13. Screw coupling ring A onto connector housing D.
14. Screw conduit thread E onto connector housing D.
15. Insert plastic clamp F into conduit thread E.

Note: Make sure that the shield intertwining surrounds the external cable mantle evenly. When pressing clamp B into part C make sure that the intertwining is not pushed into connector housing D by mistake.

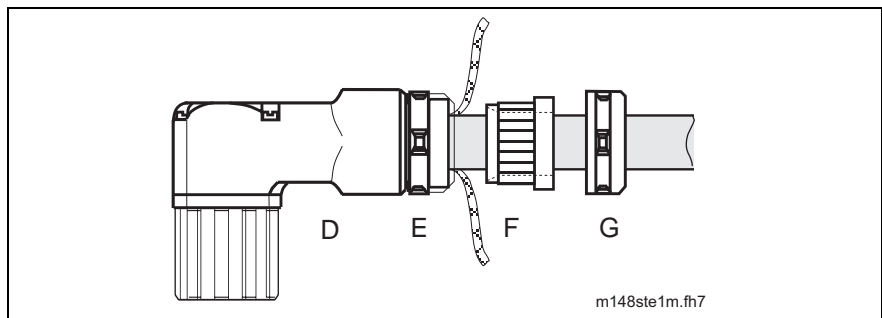


Fig. 4-24: Assembling an angle feedback connector with conduit thread

16. Cut excessive shield intertwining flush off at plastic clamp F.
17. Screw conduit thread housing E onto housing G using a tightening torque of about 7 to 8 Nm.

The connector is now ready!

4.6 Feedback connector (angled) with integral cable clamp

Feedback cable Mantle removal and stripping lengths are listed below.

Designation	Mantle removal length		Stripping length	
	Solder	Crimp	Solder	Crimp
External mantle	55 mm	55 mm	---	---
Control strands	---	---	2.0 mm	4.0

Fig. 4-25: Dismantling and stripping length of feedback cable

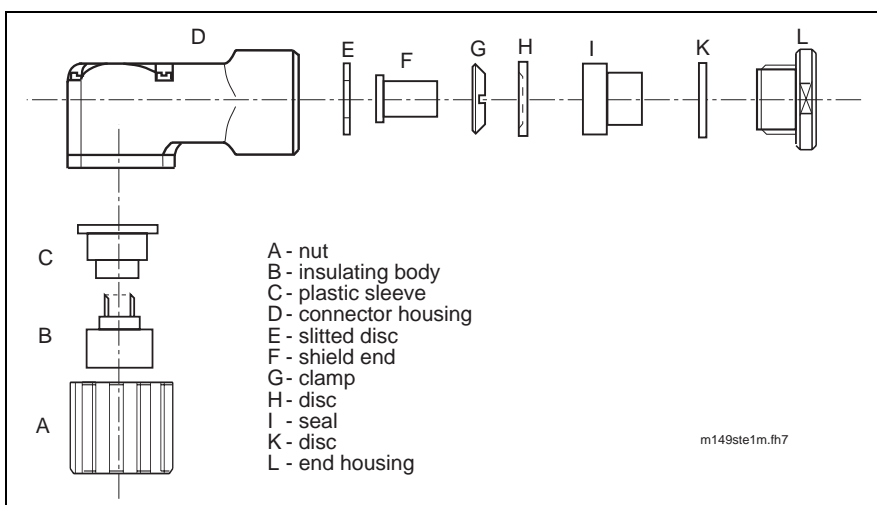


Fig. 4-26: Individual feedback connector parts

1. Take connector apart (see Fig. 4-26).
2. Push parts D, G, H, I, K and L over cable in the order specified.

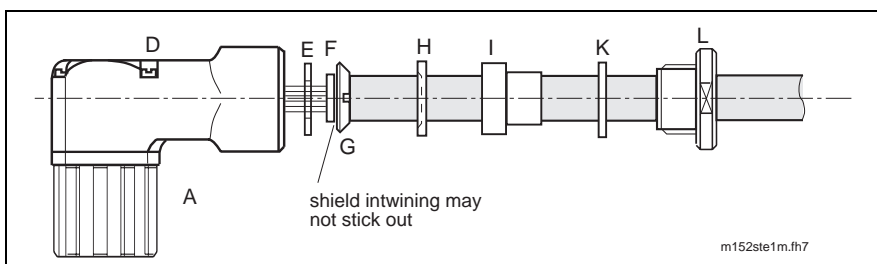


Fig. 4-27: Assembling a feedback connector

3. Dismantle feedback cable (for lengths see Fig. 4-25) Comb out complete shield, fold back over external cable mantle and fix into place with tape.
4. Insert plastic sleeves C over strands and litz wires of shield.

5. Guide litz wires and strand bundle through shield end F and push under the shield intertwining (see Fig. 4-28).

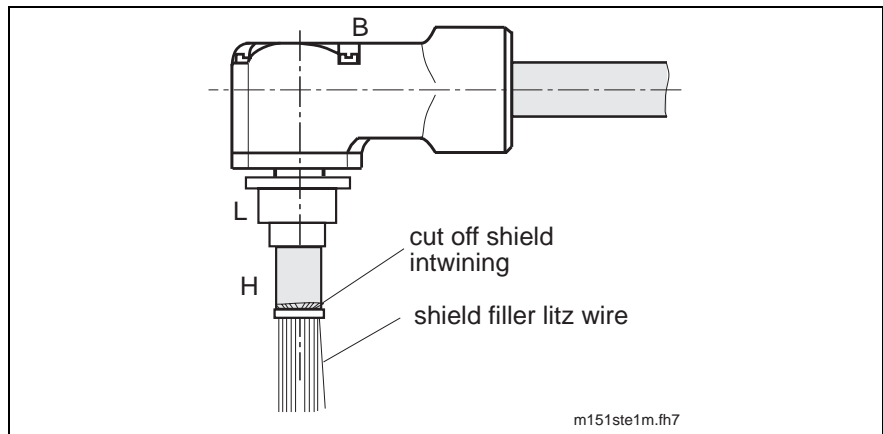


Fig. 4-28: Assembling the end piece of the shield

6. Cut off shield intertwining flush with cable mantle.

i There are two types of feedback connectors. The shield connection is different in each one. Feedback connectors with shield end piece (metal) feed their shields over the connector housing and an internal contact. Feedback connectors with shield end piece (plastic) feed their shield over an internal contact only.

Note: The intertwining of plastic shield end pieces may not have any contact with the connector housing. Make sure all is cut off flush!

The steps as of this point depend on the contact. Proceed **either** in accordance with section „making soldering contacts“ **or** „making crimp contacts“.

After the contacts have been connected (solder or crimp types) the next connector assembly steps are described in section „final assembly of solder or crimp types“.

Making solder contacts

- a) Cut cable fillers off and strip strands as described in Fig. 4-16.
- b) Push shrink sleeve (50 mm) over the filler litz wires of the shield and shrink with hot air.
- c) All strands and filler litz wires of the shield must be tin-coated.
- d) Tin coat soldered connections in connector part H.
- e) Pull shrink sleeve (9 mm) over individual strands and filler litz wires of the shield.
- f) Solder strands and litz wires into connector part H (start in the center of the connector with no.: 10, 11, 12 and so on).

Note: Push the shrink sleeve over the new soldering spot after each soldering. Pin assignment is specified in the terminal connecting plan.

g) Push shrink sleeves over strands with hot air.

Note: Remove all cut off or loose litz wire rests from connector.

Making crimp contacts

a) Cut cable fillers and strands off as per Fig. 4-25.

b) Push shrink sleeve (length of 50 mm) over litz wires of shield and shrink with hot air.

Note: The shrink sleeve may not cover the crimped area.

c) Crimp contacts with appropriate tool (see Section 4.1 Crimping tools for Signal Plug-In Connector). Insert positioner depending on whether contacts or insulation body into crimping tool.

d) Fit insulation body as per relevant terminal connection plan of the project planning manual of motor.

Note: Remove all cut off or loose litz wire rests from connector.

Final mounting of solder or crimp version

7. Insulation body B and plastic sleeves C must be inserted into coupling ring A and coupling ring connected with connector housing D.

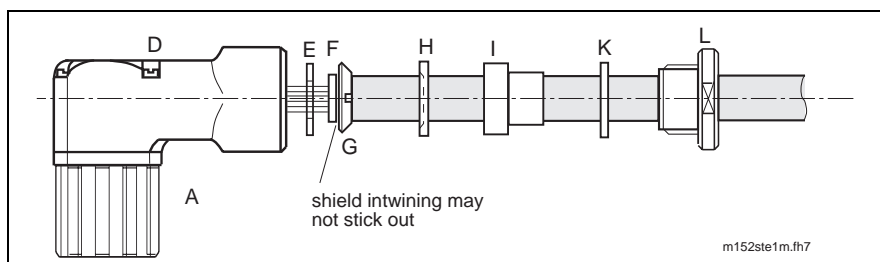


Fig. 4-29: Assembling a feedback connector

8. Push slitted disc E over the strand bundle and insert into connector housing D.

9. Push clamp G and shield end piece together.

10. Cut shield intertwining flush off at piece F.

11. Insert cable into housing D until shield end piece F is firmly in place on disc E.

12. Push parts H, I, K forward and tighten end housing L with screw driver (SW22) (tightening torque of 5 to 6 Nm).

The connector is now ready!

5 Maintaining the Crimping Tools

Parts of the crimping tools can wear down and must be checked regularly to ensure that the crimping contact is functional.

To do so, test spikes are available for the crimping tools.

Pre-requisites for a functioning crimp contact

A reliable crimp connection is only ensured if the depth of the crimping setting (SEL) is precise. This is described in the crimping tool sections of the individual connector sizes.

6 Order Designation for Crimp Tools

Designation	Material number: Order designation	See
Tools for Connector Size I (INS0680, -0681, -0682, -0683)		
crimping tools power/control contacts	274106	Fig. 2-7
contact positioner for INS0681, INS0682, INS0683	274108	Fig. 2-9
contact positioner for INS0680, -0684	274676	Fig. 2-11
assembly tool power contacts for INS0680, -0684	275422	Fig. 2-13
assembly tool control contacts for INS0680, -0684	275416	Fig. 2-14
dismantling tool power contacts for INS0680, -0684	275420	Fig. 2-15
dismantling tool control contacts for INS0680, -0684	274517	Fig. 2-16
Tools for Connector Size II (INS0480 ... 0486)		
crimping tools power/control contacts for INS0480 ... 0486	269834	Fig. 2-38
contact positioner for INS0480 ... 0486	269833	
crimping tools ground contacts for INS0480 ... 0486	237300	Fig. 2-40
dismantling tool power contacts for INS0480 ... 0486	269744	Fig. 2-41
dismantling tool control contacts for INS0480 ... 0486	274784	Fig. 2-42
Tools for Connector Size III (INS0380 ... 0386)		
crimp tool power contacts made up of:		Fig. 2-64
crimp head	237306	
Crimp jaw on top	237304	
Crimp jaw below	237305	
Table mounting	237308	
contact positioner	237309	
High-pressure hose	237307	
Hydraulic aggregate ¹⁾	237320	Fig. 2-63
1) Note: A manual hand pump is alternately available. Hand pump	237356	
crimping tools control contacts for INS0380 ... 0386	269834	Fig. 2-65
contact positioner for INS0380 ... 0386	269833	
Dismantling tool power contacts for INS0380 ... 0386	275419	Fig. 2-67
dismantling tool control contacts for INS0380 ... 0386	274784	Fig. 2-68
Tools for Signal plug-in connector		
crimping tools for signal contacts	248618	Fig. 4-2
contact positioner signal contacts	243510	Fig. 4-4
Pneumatic crimp tool for signal contacts with	243509	Fig. 4-5
Basic positioning body	274105	
contact positioner for signal contacts	243510	
Base support	245386	
Foot tripping device	243387	
Dismantling tool signal contacts	248676	Fig. 4-6
Dismantling tool insulator	248756	Fig. 4-7
Dismantling tool insulator	275418	Fig. 4-8
Special assembly tool	232300 /	Fig. 4-1 / Fig. 4-18
Tools for motors with connector boxes (MKD / MKE)		
Hand crimping tool for MKD / MKE	262293	Fig. 3-3 / Fig. 3-7

Fig. 6-1: Order designations for tools

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