

Connector Engineering

Brad
Harrison

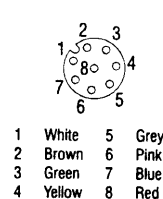
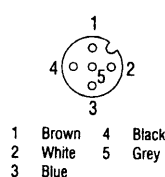
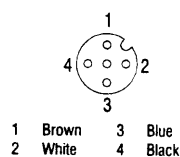
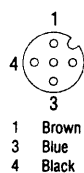
Micro-Change® (M12)
Connectors with
flying lead



Female Connector

Cable

Length (m)



Micro-Change® (M12) Straight

5 Pole/3 Wire

5 Pole/4 Wire

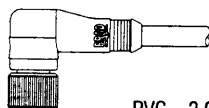
5 Pole/5 Wire

8 Pole



PVC	2.0	803000E03M020	804000E03M020	805000E03M020	
	5.0	803000E03M050	804000E03M050	805000E03M050	
	10.0	803000E03M100	804000E03M100	805000E03M100	
PUR	2.0	803000P03M020	804000P03M020	805000P03M020	808000P02M020
	5.0	803000P03M050	804000P03M050	805000P03M050	808000P02M050
	10.0	803000P03M100	804000P03M100	805000P03M100	808000P02M100
SJTO	2.0	803000S20M020	804000S20M020	805000S26M020	
	5.0	803000S20M050	804000S20M050	805000S26M050	
	10.0	803000S20M100	804000S20M100	805000S26M100	

Micro-Change® (M12) 90°



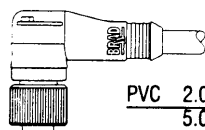
PVC	2.0	803001E03M020	804001E03M020	805001E03M020	
	5.0	803001E03M050	804001E03M050	805001E03M050	
	10.0	803001E03M100	804001E03M100	805001E03M100	
PUR	2.0	803001P03M020	804001P03M020	805001P03M020	808001P02M020
	5.0	803001P03M050	804001P03M050	805001P03M050	808001P02M050
	10.0	803001P03M100	804001P03M100	805001P03M100	808001P02M100
SJTO	2.0	803001S20M020	804001S20M020	805001S26M020	
	5.0	803001S20M050	804001S20M050	805001S26M050	
	10.0	803001S20M100	804001S20M100	805001S26M100	

Micro-Change® (M12) PNP LED



PVC	2.0	8030P0E03M020	8040P0E03M020	
	5.0	8030P0E03M050	8040P0E03M050	
	10.0	8030P0E03M100	8040P0E03M100	
PUR	2.0	8030P0P03M020	8040P0P03M020	
	5.0	8030P0P03M050	8040P0P03M050	
	10.0	8030P0P03M100	8040P0P03M100	
SJTO	2.0	8030P0S20M020	8040P0S20M020	
	5.0	8030P0S20M050	8040P0S20M050	
	10.0	8030P0S20M100	8040P0S20M100	

Micro-Change® (M12) 90° PNP LED



PVC	2.0	8030P1E03M020	8040P1E03M020	
	5.0	8030P1E03M050	8040P1E03M050	
	10.0	8030P1E03M100	8040P1E03M100	
PUR	2.0	8030P1P03M020	8040P1P03M020	
	5.0	8030P1P03M050	8040P1P03M050	
	10.0	8030P1P03M100	8040P1P03M100	
SJTO	2.0	8030P1S20M020	8040P1S20M020	
	5.0	8030P1S20M050	8040P1S20M050	
	10.0	8030P1S20M100	8040P1S20M100	



Male Connector

Cable
Length (m)

Micro-Change® (M12) Straight



1 Brown
3 Blue
4 Black

5 Pole/3 Wire



1 Brown 3 Blue
2 White 4 Black

5 Pole/4 Wire



1 Brown 4 Black
2 White 5 Grey
3 Blue

5 Pole/5 Wire

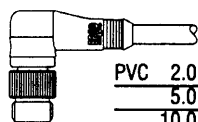


1 White 5 Grey
2 Brown 6 Pink
3 Green 7 Blue
4 Yellow 8 Red

8 Pole

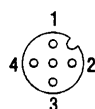
PVC	2.0	803006E03M020	804006E03M020	805006E03M020	
	5.0	803006E03M050	804006E03M050	805006E03M050	
	10.0	803006E03M100	804006E03M100	805006E03M100	
PUR	2.0	803006P03M020	804006P03M020	805006P03M020	808006P02M020
	5.0	803006P03M050	804006P03M050	805006P03M050	808006P02M050
	10.0	803006P03M100	804006P03M100	805006P03M100	808006P02M100
SJTO	2.0	803006S20M020	804006S20M020	805006S26M020	
	5.0	803006S20M050	804006S20M050	805006S26M050	
	10.0	803006S20M100	804006S20M100	805006S26M100	

Micro-Change® (M12) 90°



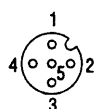
PVC	2.0	803007E03M020	804007E03M020	805007E03M020	
	5.0	803007E03M050	804007E03M050	805007E03M050	
	10.0	803007E03M100	804007E03M100	805007E03M100	
PUR	2.0	803007P03M020	804007P03M020	805007P03M020	808007P02M020
	5.0	803007P03M050	804007P03M050	805007P03M050	808007P02M050
	10.0	803007P03M100	804007P03M100	805007P03M100	808007P02M100
SJTO	2.0	803007S20M020	804007S20M020	805007S26M020	
	5.0	803007S20M050	804007S20M050	805007S26M050	
	10.0	803007S20M100	804007S20M100	805007S26M100	

Micro-Change® (M12) Field Attachable Connectors



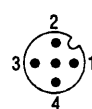
1 Brown 3 Blue
2 White 4 Black

4 Pole



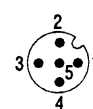
1 Brown 4 Black
2 White 5 Grey
3 Blue

5 Pole



1 Brown 3 Blue
2 White 4 Black

4 Pole



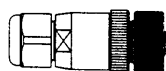
1 Brown 4 Black
2 White 5 Grey
3 Blue

5 Pole

Female Attachables

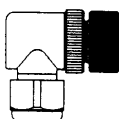
Gland
Size

Micro-Change® (M12) Straight



PG7	8A4000-315	8A5000-315
PG9	8A4000-325	8A5000-325

Micro-Change® (M12) 90°

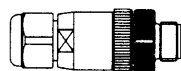


PG7	8A4001-315	8A5001-315
-----	------------	------------

Male Attachable

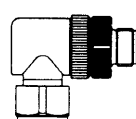
Gland
Size

Micro-Change® (M12) Straight



PG7	8A4006-315	8A5006-315
PG9	8A4006-325	8A5006-325

Micro-Change® (M12) 90°

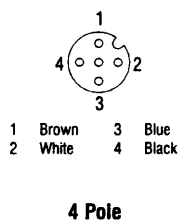


PG7	8A4007-315	8A5007-315
-----	------------	------------

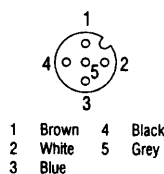


Female Receptacle

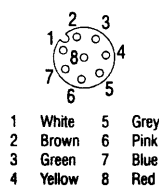
Wire length (mm)



4 Pole

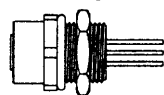


5 Pole



8 Pole

Micro-Change® Female M14 Panel Mount



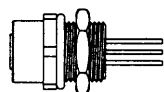
300.0

8R4E30E03C3003

8R5E30E03C3003

8R8E30E03C3003

Micro-Change® Female PG9 Panel Mount



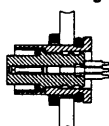
300.0

8R4J30E03C3003

8R5J30E03C3003

8R8J30E03C3003

Micro-Change® Female PG9 PCB Mount



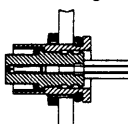
n/a

8R4J400013

8R5J400013

n/a

Micro-Change® Female PG9 Through Panel



300.0

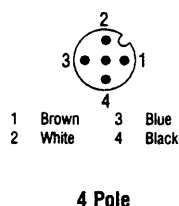
8R4J40E03C3003

8R5J40E03C3003

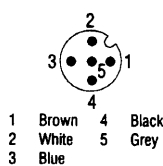
n/a

Male Receptacle

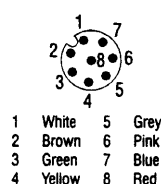
Wire Length (mm)



4 Pole

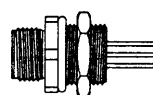


5 Pole



8 Pole

Micro-Change® Male M14 Panel Mount



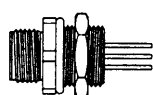
300.0

8R4E36E03C3003

8R5E36E03C3003

8R8E36E03C3003

Micro-Change® Male PG9 Panel Mount



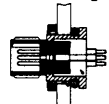
300.0

8R4J36E03C3003

8R5J36E03C3003

8R8J36E03C3003

Micro-Change® Male PG9 PCB Mount



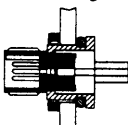
n/a

8R4J460003

8R5J460003*

n/a

Micro-Change® Male PG9 Through Panel



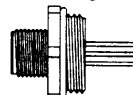
300.0

8R4J46E03C3003

8R5J46E03C3003

n/a

Micro-Change® Male PG13.5 Short Sensor Mount



300.0

8R4D26E03C3003

8R5D26E03C3003

n/a

* Check sales office for availability

Multi-Port Splitter Box Matrix

B T Y 8 0 0 P - F B P - 0 5

Nano-Change® Multi-Ports
BEY - End Cable Entry
BNY - Top Cable Entry & Connector
Micro-Change® Multi-Ports
BTY - Top Mount
BSY - Side Mount

Length
05 - 5 metres
10 - 10 metres
20 - 20 metres

*Balluff/
Multiswitch
Prefix all part
numbers in
this section
with BK -.

Number of Ports
4 - 4 Ports
6 - 6 Ports
8 - 8 Ports
A - 10 Ports

Wiring Configuration
00/01 - 5 Pole/4 Wire - Single I/O per port
03/05 - 5 Pole/5 Wire - Twin I/O per port
04 - 4 Pole/3 Wire - Single I/O per port - no earth

LED Configuration
P - PNP Format
N - NPN Format**
0 - No LEDs**

Termination Options

Pre-wired versions*
E - PVC Cable
P - PUR Cable

Connectorised versions
B - Mini-Change® Connector
C - M16 or M23 Connector

Receptacle Material
FB - Standard
FX - Plastic**
FS - Stainless Steel**

Connector Matrix

8 0 3 0 0 0 E 0 3 M 0 2 0

Options:

Not all are available on
standard delivery terms,
please consult our sales
office before ordering

* Refer to cable
specification and use
code indicated in matrix
above

**NPN or no LED
indication, select from
above part number
matrixes, minimum order
quantity 25 pieces for
Connectors and 5 pieces
for Multi-Ports

**Coupling materials
and connector colour
minimum quantities
apply to all orders

**Choice of suppression
and LED colour for
mPm® product, please
request separate
catalogue

Connector Type

Nano-Change® M8 Snap
50 - Moulded Connector
55 - Nano Jumper
58 - Nano to Micro Jumper

Nano-Change® M8 Coupler
40 - Moulded Connector
44 - Nano Jumper
48 - Nano to Micro Jumper

Micro-Change® M12 Coupler
80 - Moulded Connector
88 - Micro Jumper
84 - Micro to Nano Jumper

mPm® DIN 43650 Jumpers
D4 - Form B (10mm) to Nano
E4 - Form A (18mm) to Nano
F4 - Form B (11mm) to Nano
G4 - Form C (9.4mm) to Nano
H4 - Form C (8.0mm) to Nano
D8 - Form B (10mm) to Micro
E8 - Form A (18mm) to Micro
F8 - Form B (11mm) to Micro
G8 - Form C (9.8mm) to Micro
H8 - Form C (8.0mm) to Micro

Cable ID No.*

E03 - Yellow PVC 0.34mm²
P03 - Black PUR 0.34mm²
S20 - Yellow SJTO type 0.34mm²

Cable Length

M010 - 1.0 metres
M020 - 2.0 metres
M030 - 3.0 metres

Coupling Materials**

1 - Stainless Steel

5 - Plastic

Connector Colour**

A - Grey Head Moulding

G - Black Head Moulding

Head Configuration

Moulded Connectors

000 - Female Straight
001 - Female 90°
0N0 - Female Straight NPN LED**
0N1 - Female 90° NPN LED**
0P0 - Female Straight PNP LED
0P1 - Female 90° PNP LED
006 - Male Straight
007 - Male 90°

Jumpers - Basic Brad® Only

030 - Female Straight to Male Straight
031 - Female 90° to Male Straight
032 - Female Straight to Male 90°
033 - Female 90° to Male 90°
0P6 - Female Straight PNP LED to Male Straight
0P7 - Female 90° PNP LED to Male Straight
0P8 - Female Straight PNP LED to Male 90°
0P9 - Female 90° PNP LED to Male 90°

Number of Poles

3 - 3 Pole
4 - 4 Pole

5 - 5 Pole
8 - 8 Pole

Connector Specification

Series	40, 4R, 44, 50, 5R, 55		N03, N04		80, 8R, 88		8A		30		L0		K0			
Product	Nano-Change®		Nano-Change®		Micro-Change®		Micro-Change®		Mini-Change®		mPm® DIN 43650		M16 Connector		M23 Connector	
Connector Type	Moulded & Receptacles		Attachables		Moulded & Receptacles		Attachables		Moulded		Moulded & Attachable		Moulded		Moulded	
Connector Size	M8 Coupler & Snap		M8 Coupler		M12 Coupler		M12 Coupler		1 1/8" UNF Coupler		Form A, B & C		M16 Coupler		M23 Coupler	
Number of Poles	3 to 5		3 & 4		3, 4, 5 & 8		4 & 5		12 & 19		2 + earth		14		12 & 19	
Contact Material	Female	Gold plated Brass	Gold plated Brass		Gold Plated Brass		Silver plated Brass		Gold plated Brass		Silver plated Brass		Gold plated Brass		Gold plated Brass	
	Male	Gold plated Brass	Gold plated Brass		Gold plated Brass		Silver plated Brass		Gold plated Brass		n/a		n/a		Gold plated Brass	
Insert Material	PUR		PA		PA		PA		PVC		PA (+G)		PPO		PUR	
O-ring Material	Viton		Viton		Viton		Viton		n/a		Profiled NBR		EPDM - Rubber		NBR	
Body Material	PVC		PA		PVC		PA		PVC		PP		PUR		PUR	
Coupling Material	Nickel plated Brass		Nickel plated Brass		Epoxy Coated Zinc		Nickel plated Brass		Epoxy Coated Zinc		n/a		Aluminium		Nickel plated Brass	
Voltage Rating	Standard	60 Vac/75 Vdc	60 Vac/75 Vdc		3, 4 & 5 pole - 250 Vac/300 Vdc		4 pole - 250 Vac/300 Vdc		600 Vac/dc		250 Vac/dc		150 Vac/dc		63 Vac/dc	
					8 pole - 30 Vac/36 Vdc		5 pole - 30 Vac/36 Vdc									
	With LED	10 to 30 Vdc	n/a		10 to 30 Vdc		n/a		n/a		24 Vac/dc		n/a		n/a	
Contact Current Rating	4 Amps		4 Amps		4 Amps		4 Amps		Ø 1.0mm - 4 Amps Ø 2.0mm - 13 Amps		Form A & B - 18 Amps Form C - 10 Amps		3 Amps		Ø 1.0mm - 6 Amps Ø 1.5mm - 12 Amps	
Protection Class	IP67		IP67		IP68		IP68		IP68		IP65		IP67		IP67	

Environmental Rating - IP68. Is defined as immersion in water at a pressure of 100 pounds per square inch for a duration of one hour, and wash down at a pressure of 1000 pounds per square inch. When used with a mating pair of Brad Harrison® connectors.

Connector Engineering

Multi-Port Specification

Brad
Harrison

Specifications

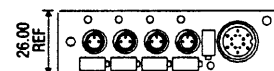
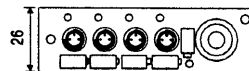
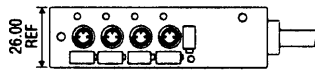
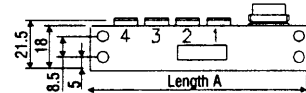
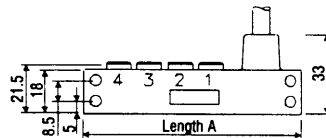
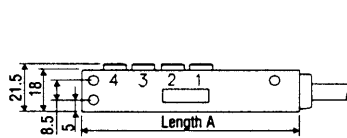
Series	BEY & BNY	BEY & BNY	BTY	BTY	BSY
Product	Nano-Change - Single I/O	Nano-Change - Twin I/O	Micro-Change Top Mount Single I/O	Micro-Change Top Mount Twin I/O	Micro-Change Side Mount Single I/O
I/O Connectors	M8 Coupler	M8 Coupler	M12 Coupler	M12 Coupler	M12 Coupler
Number of I/O	4, 6, 8 & 10	8, 12, 16 & 20	4, 6 & 8	8, 12 & 16	4, 6 & 8
Contact Material	Gold plated Brass	Gold plated Brass	Gold plated Brass	Gold plated Brass	Gold plated Brass
Insert Material	PUR	PUR	PBT	PBT	PA
O-ring Material	Viton	Viton	Viton	Viton	Viton
Body Material	PBT	PBT	PBT	PBT	PA
Coupling Material	Nickel plated Brass	Nickel plated Brass	Nickel plated Brass	Nickel plated Brass	Epoxy coated Zinc
Voltage Rating with LED	10 to 30 Vdc	10 to 30 Vdc	10 to 30 Vdc	10 to 30 Vdc	10 to 30 Vdc
Current Rating Per I/O	2 Amps	1 Amps	2 Amps	2 Amps	2 Amps
Total Unit - Cable Version	6 Amps	6 Amps	12 Amps	12 Amps	12 Amps
Total Unit - Connector Version	6 Amps	3 Amps	12 Amps	12 Amps	12 Amps
Protection Class	Cable - IP68 M16 Connector - IP67	Cable - IP68 M16 Connector - IP67	Cable - IP68 M23 Connector - IP67 Mini-Change - IP68	Cable - IP68 M23 Connector - IP67 Mini-Change - IP68 Attachable - IP67	Cable - IP68 Mini-Change - IP68

Cable Specification

ID No	No of Cores	Jacket Colour	Cross Section	Stranding Group	Screen	Nominal Diameter	Nano-Change	Micro-Change	Mini-Change	M23 Connectr.	M16 Connectr.	mPm DIN 43650	Nano Multi Ports	Micro Multi Ports
PVC - General Purpose - Conveyors, Food Processing, etc - 300 V, -5°C to +70°C, PVC Outer Jacket over PVC Insulation														
E02	3 & 4	Yellow	0.25mm ²	B	None	4.5mm	✓	✓						
E03	3 & 4	Yellow	0.34mm ²	C	None	5.0mm	✓	✓						
	5					5.5mm	✓	✓						
E12	3	Black	0.50mm ²	E	None	5.5mm	✓	✓						
E18	3 & 4	Yellow	0.20mm ²	C	80% Braid	5.0mm	✓	✓				✓		
E51	4	Grey	0.25mm ²	B	None	4.5mm	✓	✓						
E52	3 & 4	Grey	0.34mm ²	C	None	5.0mm	✓	✓						
	5					5.5mm	✓	✓						
PVC for Multi-Ports - General Purpose - Conveyors, Food Processing, etc - 300 V, -5°C to +70°C, PVC Outer Jacket over PVC Insulation														
E80	7	Yellow	4x0.34 & 3x0.75mm ²	C & E	None	8.4mm			✓	✓				✓
	9					9.5mm			✓	✓				✓
	11					9.5mm			✓	✓				✓
	15					9.8mm			✓	✓				✓
	19					11.4mm			✓	✓				✓
CEI PVC - IEC332.3A - Self Extinguishing, Flame Retardant Oil Resistant PVC - 300 V, -5°C to +70°C, CEI PVC Outer Jacket over CEI PVC Insulation														
I02	3 & 4	Grey	0.25mm ²	B	None	4.5mm	✓	✓						
I03	3 & 4	Grey	0.34mm ²	C	None	5.0mm	✓	✓						
	5					5.5mm	✓	✓						
I20	3	Grey	0.34mm ²	C	80% Braid	5.0mm	✓	✓						
	4					6.3mm	✓	✓						
SJTO Type - UL listed/CSA Approved - Self Extinguishing & Flame Retardant - Good weld splatter resistance & rough duty use - 300 V, -40°C to +105°C, UL/CSA PVC Outer Jacket over UL/CSA PVC Insulation														
S20	3 & 4	Yellow	0.34mm ²	D	50% Braid	6.3mm		✓						
S26	5	Yellow	0.34mm ²	D	50% Braid	6.5mm		✓				✓		
PUR - General Purpose, Oil resistant for machining applications - 300 V, -5°C to +90°C, PUR Outer Jacket over PVC Insulation														
P03	3 & 4	Black	0.34mm ²	C	None	5.0mm	✓	✓						
	5					5.5mm	✓	✓						
P08	3 & 4	Yellow	0.25mm ²	A	None	4.5mm	✓	✓						
P09	3 & 4	Black	0.34mm ²	A	None	5.0mm	✓	✓						
P12	3	Black	0.50mm ²	E	None	5.5mm	✓	✓						
P18	4 & 5	Black	0.20mm ²	C	80% Braid	5.0mm	✓	✓				✓		
PUR for Multi-Ports - General Purpose, Oil resistant for machining applications - 300 V, -5°C to +90°C, PUR Outer Jacket over PVC Insulation														
P80	7	Black	4x0.34 & 3x0.75mm ²	C & E	None	8.4mm			✓	✓				✓
	9					9.5mm			✓	✓				✓
	11					9.5mm			✓	✓				✓
	15					9.8mm			✓	✓				✓
	19					11.4mm			✓	✓				✓
P78	6	Black	4x0.34 & 2x0.75mm ²	C & C	None	8.4mm			✓	✓			✓	✓
	8					9.5mm			✓	✓			✓	✓
	10					9.8mm			✓	✓			✓	✓
	12					9.8mm			✓	✓			✓	✓
	14					9.8mm			✓	✓			✓	✓
	18					11.4mm			✓	✓			✓	✓
P75	22		20x0.25 & 2x0.50mm ²	C & C		11.4mm			✓	✓			✓	✓
LSOH PUR - Low Smoke Zero Halogen - Baggage handling, public building use - 300 V, -40°C to +70°C, LSOH PUR Outer Jacket over Polyethylene Insulation														
H03	4	Yellow	0.34mm ²	C	None	5.0mm	✓	✓						
H69	4	Grey	0.20mm ²	C	Foil with Drain	4.5mm	✓	✓						

Stranding and Cross Sectional Area Table

Stranding Group	0.20mm ²	0.25mm ²	0.34mm ²	0.50mm ²	0.75mm ²	Diameter of Strands
A		128	174			0.05mm
B		65				0.07mm
C	27	32	42	64	95	0.10mm
D			26			0.13mm
E			19	28	42	0.15mm



Nano-Change® Cable End MPIS

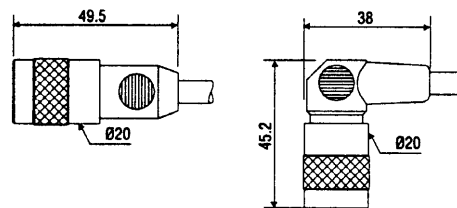
No. of Ports	Length A (mm)
4	95
6	120
8	145
10	170

Nano-Change® Cable Top MPIS

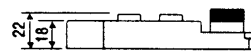
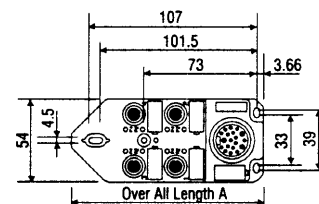
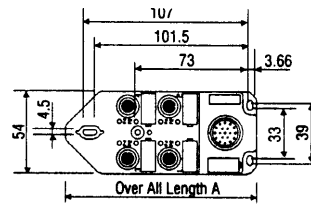
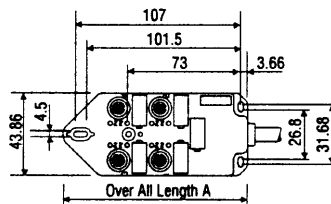
No. of Ports	Length A (mm)
4	88
6	113
8	138
10	163

Nano-Change® M16 Con MPIS

No. of Ports	Length A (mm)
4	88
6	113
8	138
10	163



M16 Home Run Connectors for Nano-Change® Multi-Port



Micro-Change® Top Mount Cable End

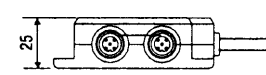
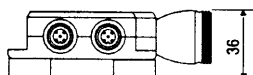
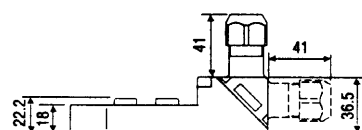
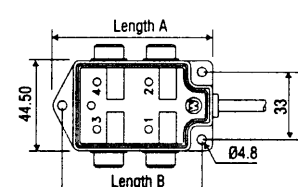
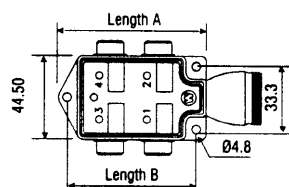
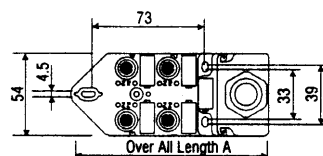
No. of Ports	Length A (mm)
4	120
6	125
8	152

Micro-Change® Top Mount M23 Con

No. of Ports	Length A (mm)
4	125
6	125
8	152

Micro-Change® Top Mount Mini-Change

No. of Ports	Length A (mm)
4	125
6	125
8	152



Micro-Change® Field Attachable

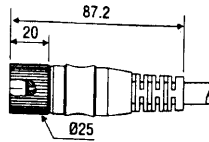
No. of Ports	Length A (mm)
4	128.8
6	133.8
8	160.8

Micro-Change® Mini-Con MPIS

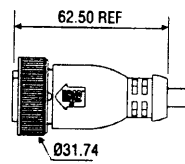
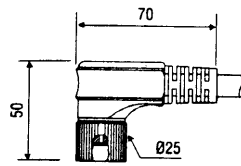
No. of Ports	Length A (mm)	Length B (mm)
4	78	68
6	104	94
8	129	119

Micro-Change® Cable End MPIS

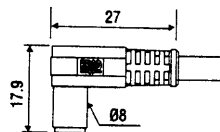
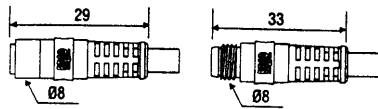
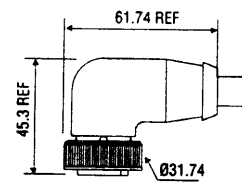
No. of Ports	Length A (mm)	Length B (mm)
4	78	68
6	104	94
8	129	119



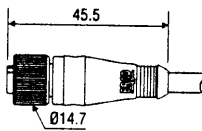
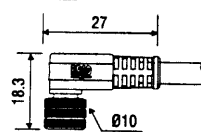
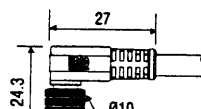
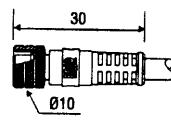
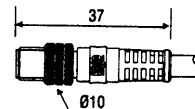
M23 Home Run Connectors for Micro-Change® Multi-Port



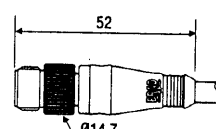
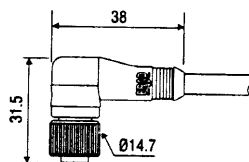
Mini-Change Home Run Connectors for Micro-Change® Multi-Port



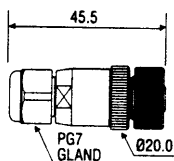
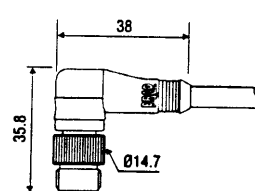
Nano-Change (M8) Moulded Connectors



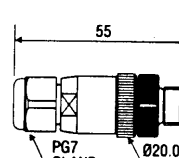
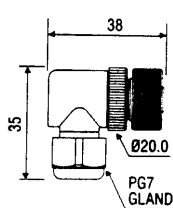
Micro-Change® (M12) Moulded Connectors - Female



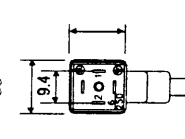
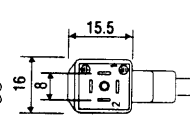
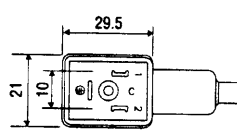
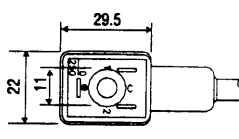
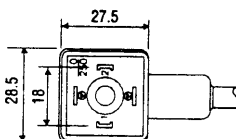
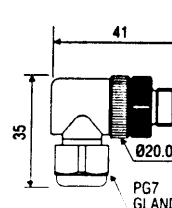
Micro-Change® (M12) Moulded Connectors - Male



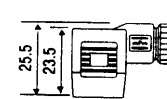
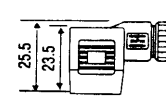
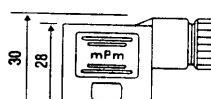
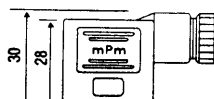
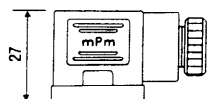
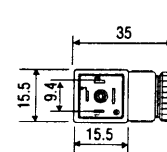
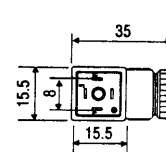
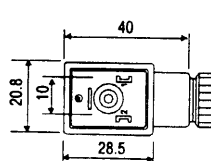
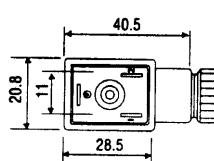
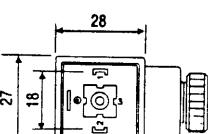
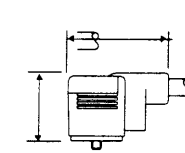
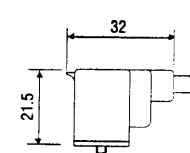
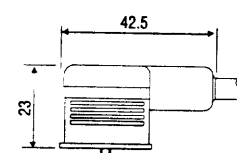
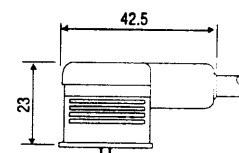
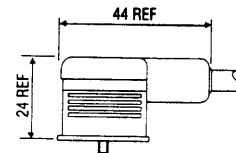
Micro-Change® (M12) Field Attachable Connectors - Female



Micro-Change® (M12) Field Attachable Connectors - Male



mPm® DIN 43650 Moulded Connectors



mPm® DIN 43650 Attachable Connectors