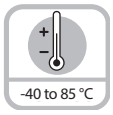
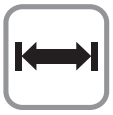
Draw Wire Encoder DW110



Wide temperature range


Reverse polarity protection

Max acceleration


Long service life

High protection level

Robust

- **Corrosion resistant:** Titanium-anodized aluminium housing.
- **High-strength stainless steel draw wire.**
- **Low friction design.** Diamond-polished ceramic guide.
- **Wide temperature range**.

RoHS compliant
SSI
PROFIBUS
PROFINET
EtherCAT Conformance tested
Analog output
CANopen
SAE J1939
EtherNet/IP

Versatile

- **Suitable for various sensors/encoders:** Absolute, fieldbus, incremental and analog.
- **Quick mounting:** Fastening by means of two screws.
- **Flexible connection options:** Cable, connector, radial, axial.
- **Linearity up to 0.05%**.

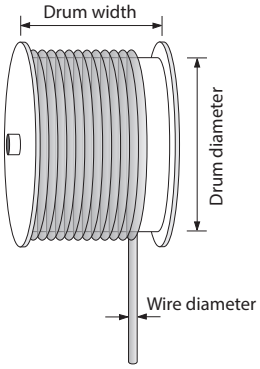
Fast

- **High traverse speed.**
- **High acceleration:** Dynamic spring traction by means of a constant force spring.

Mechanical Characteristics (Draw Wire Mechanics):

Measuring range:		1000 mm	2000 mm	3000 mm
Extension force:	Fmin	1.55 lbs (6.9 N)	1.44 lbs (6.4 N)	1.55 lbs (6.9 N)
	Fmax	1.87 lbs (8.3 N)	1.75 lbs (7.8 N)	2.20 lbs (9.8 N)
Max. speed:		32.8 ft/s (10 m/s)	32.8 ft/s (10 m/s)	32.8 ft/s (10 m/s)
Max. acceleration:		459.3 ft/s² (140 m/s²)	459.3 ft/s² (140 m/s²)	459.3 ft/s² (140 m/s²)
Linearity (of measuring range):				
	analog sensor	±0.15%	±0.1%	±0.1%
	encoder	±0.05%	±0.05%	±0.05%
Weight:		approx. 750 g (depending on the sensor/encoder used)		
Materials:		housing: titanium-anodized aluminium wire: stainless steel Ø 0.5 mm		
Protection (encoder only):		IP65		

Operating Principle:



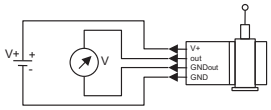
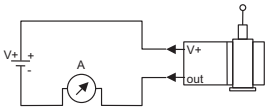
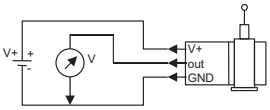
Construction:
The core of a draw wire device is a drum mounted on bearings, onto which a wire is wound. Winding takes place via a spring-loaded device.

Note:
Exceeding the maximum extension length of the draw wire will lead to damage to the wire and the mechanics.

Turck Inc. | 3000 Campus Drive, Minneapolis, MN 55441 | T +1 800 544 7769 | F +1 763 553 0708 | www.turck.com

Draw Wire Encoder DW110

Electrical Characteristics (Analog Output):

Analog output [Key Code]:	0-10 V [8C]	4-20 mA [7E]	Potentiometer [PA]
Output:	0-10 V galvanically isolated, 4 conductors	4-20 mA, 2 conductors	1 kOhm
Supply voltage:	12-30 VDC	12-30 VDC	max. 30 VDC
Recommended slider current:	-	-	< 1 µA
Max. current consumption:	22.5 mA (no load)	50 mA	-
Reverse polarity protection:	yes	yes	-
Operating temperature:	-4 to +185 °F (-20 to +85 °C)	-4 to +185 °F (-20 to +85 °C)	-4 to +185 °F (-20 to +85 °C)
Connection diagrams:			
ROHS compliant according to EU guideline 2011/65/EU			

Electrical Characteristics (Digital Output):

The electrical characteristics of the draw wire encoder assembly may be found in the catalog pages of the encoder selected.

Part Number Key: DW110 with Encoder

A	B		C		D		E	F		G		H
DW	1000	-	110	-	10	-	2B	2000	-	H1181	/	Specials

A	Type
DW	Draw Wire

B	Measuring Range
1000	1000 mm Steel Wire
2000	2000 mm Steel Wire
3000	3000 mm Steel Wire

C	Housing
110	80 mm

D	Encoder Type
10	RI-10, Incremental
28	RM-28, Absolute, SSI
29	RM-29, Absolute, CANopen, EtherCAT, PROFIBUS-DP, PROFINET IO
103	RM-103, Absolute, SSI
105	RM-105, Absolute, CANopen, EtherNet/IP, Modbus
118	RM-118, Absolute, SSI
121	RM-121, Absolute, CANopen, SAE J1939

E	Voltage Supply and Output Type
Dependent on Encoder Selected [1)]	

F	Pulse Rate/Resolution
Dependent on Encoder Selected [1)]	

G	Type of Connection
Dependent on Encoder Selected [1)]	

H	Specials
N85	Interchangeable Installation *
Dependent on Encoder Selected [1)]	

[1)]Recommended encoders listed below
*Optional

Accessories:

- See page H1, Connectivity, for cables and connectors

Draw Wire Encoder DW110

Standard resolutions for draw wire with incremental encoder RI-10, drum circumference 200 mm

Encoder PPR	200	2000	4000
Pulses/mm	1	10	20
Resolution (mm)	1	0.1	0.05

Standard resolutions for draw wire with absolute encoder RM-118 or RM-121, drum circumference 200 mm

Pulses/revolution	4096
Pulses/mm	20.5
Resolution (mm)	0.05

Recommended standard variants (with incremental, absolute encoder)

Draw wire assembly	Mounted encoder	Interface	Power supply	Type of connection	Resolution / Protocol	Option
DWxxxx-110-10-2B2000-H1181	RI-10T10C-2B2000-H1181	Push-pull with inverted signal	10-30 VDC	Radial M12 connector	2000 ppr	-
DWxxxx-110-118-3C12S12M-H1181	RM-118T10C-3C12S12M-H1181	SSI	10-30 VDC	Radial M12 connector	4096 ppr / SSI-Gray-Code	-
DWxxxx-110-121-9D38B-H1151	RM-121T10C-9D38B-H1151	CANopen	10-30 VDC	Radial M12 connector	CANopen encoder profile DS406 V4.0	-

Other variants (with absolute encoder)

Draw wire assembly	Mounted encoder	Interface	Power supply	Type of connection	Resolution / Protocol	Option
DWxxxx-110-103-3C12S12M-H1181	RM-103T10C-3C12S12M-H1181	SSI	10-30 VDC	1 x radial M12 connector	4096 ppr / SSI-Gray-Code	SET button + status LED
DWxxxx-110-28-3C24B-H1181	RM-28T10C-3C24B-H1181	SSI	10-30 VDC	1 x radial M12 connector	4096 ppr / SSI-Gray-Code	SET button + status LED
DWxxxx-110-105-9D38B-H1151/N46	RM-105T10C-9D38B-B1M12/N46	CANopen	10-30 VDC	1 x radial M12 connector	CANopen encoder profile DS406 V3.2	SET button
DWxxxx-110-29-9D28B-R2M12/N46	RM-29T10C-9D28B-R2M12/N46	CANopen	10-30 VDC	2 x radial M12 connector	CANopen encoder profile DS406 V3.2	SET button
DWxxxx-110-121-9F43B-H1151	RM-121T10C-9F43B-H1151	SAE J1939	10-30 VDC	1 x radial M12 connector	CAN high-speed acc. to ISO 11898, CAN specification 2.0 B	-
DWxxxx-110-29-9A28B-R3M12/N46	RM-29T10C-9A28B-R3M12/N46	PROFIBUS	10-30 VDC	3 x radial M12 connector	Profibus-DP V0 encoder profile Class 2	SET button
DWxxxx-110-29-9C28B-R3M12	RM-29T10C-9C28B-R3M12	EtherCAT	10-30 VDC	3 x radial M12 connector	EtherCAT with CoE 3.2.10	-
DWxxxx-110-29-9E28B-R3M12	RM-29T10C-9E28B-R3M12	PROFINET IO	10-30 VDC	3 x radial M12 connector	PROFINET encoder profile version 4.1	-
DWxxxx-110-105-9N32B-B3M12	RM-105T10C-9N32B-B3M12	EtherNet/IP	10-30 VDC	3 x axial M12 connector	EtherNet/IP	-

Draw Wire Encoder DW110

Part Number Key: DW110 with Encoder (analog, scalable)

A	B		C		D		E	F		G		H
DW	1000	-	110	-	116	-	7A	AL	-	H1151	/	Specials

A	Type
DW	Draw Wire

B	Measuring Range
1000	1000 mm Steel Wire
2000	2000 mm Steel Wire
3000	3000 mm Steel Wire

C	Housing
110	80 mm

D	Encoder Type
116	RM-116, Absolute, Analog

E	Voltage Supply and Output Type
Dependent on Encoder Selected [1)]	

F	Measuring Range
Dependent on Encoder Selected [1)]	

G	Type of Connection
Dependent on Encoder Selected [1)]	

H	Specials
N85	Interchangeable Installation *
Dependent on Encoder Selected [1)]	

[1)]Recommended encoders listed below
*Optional

Recommended standard variants (with analog encoder, scalable with limit switch function)

Draw wire assembly	Mounted encoder	Interface	Power supply	Type of connection	Resolution / Protocol	Option
DWxxxx-110-116-7ASALNS-H1151	RM-116T10C-7ASALNS-H1151	Analog, 4-20 mA	10-30 VDC	Radial M12 connector	12 Bit / 4-20 mA	scalable without limit switch function
DWxxxx-110-116-8BSALNS-H1151	RM-116T10C-8BSALNS-H1151	Analog, 0-10 V	15-30 VDC	Radial M12 connector	12 Bit / 0-10 V	scalable without limit switch function
DWxxxx-110-116-7ASALWL-H1151	RM-116T10C-7ASALWL-H1151	Analog, 4-20 mA	10-30 VDC	Radial M12 connector	12 Bit / 4-20 mA	scalable with limit switch function
DWxxxx-110-116-8BSALWL-H1151	RM-116T10C-8BSALWL-H1151	Analog, 0-10 V	15-30 VDC	Radial M12 connector	12 Bit / 0-10 V	scalable with limit switch function

Draw Wire Encoder DW110

Part Number Key: DW110 with Analog Sensor

A	B		C		D		E
DW	1000	-	110	-	7E	-	H1441

A	Type
DW	Draw Wire

B	Measuring Range
1000	1000 mm Steel Wire
2000	2000 mm Steel Wire
3000	3000 mm Steel Wire

C	Housing
110	80 mm

D	Voltage Supply and Output Type
7E	12-30 VDC, 4-20 mA
8C	12-30 VDC, 0-10 V
PA	30 VDC max, 1 kΩ, Potentiometer

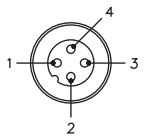
E	Type of Connection
H1441	Axial 4-pin M12 Eurofast Connector
CA	Axial Cable (2 m PVC)

Standard Wiring:

Pin	Color	0-10 V	4-20 mA	1 kOhm
1	BN	V+	V+	V+
2	WH	Signal	N/C	Slider
3	BU	GND	Signal	GND
4	BK	GND Sig.	N/C	N/C

Wiring Diagram:

Male Encoder View

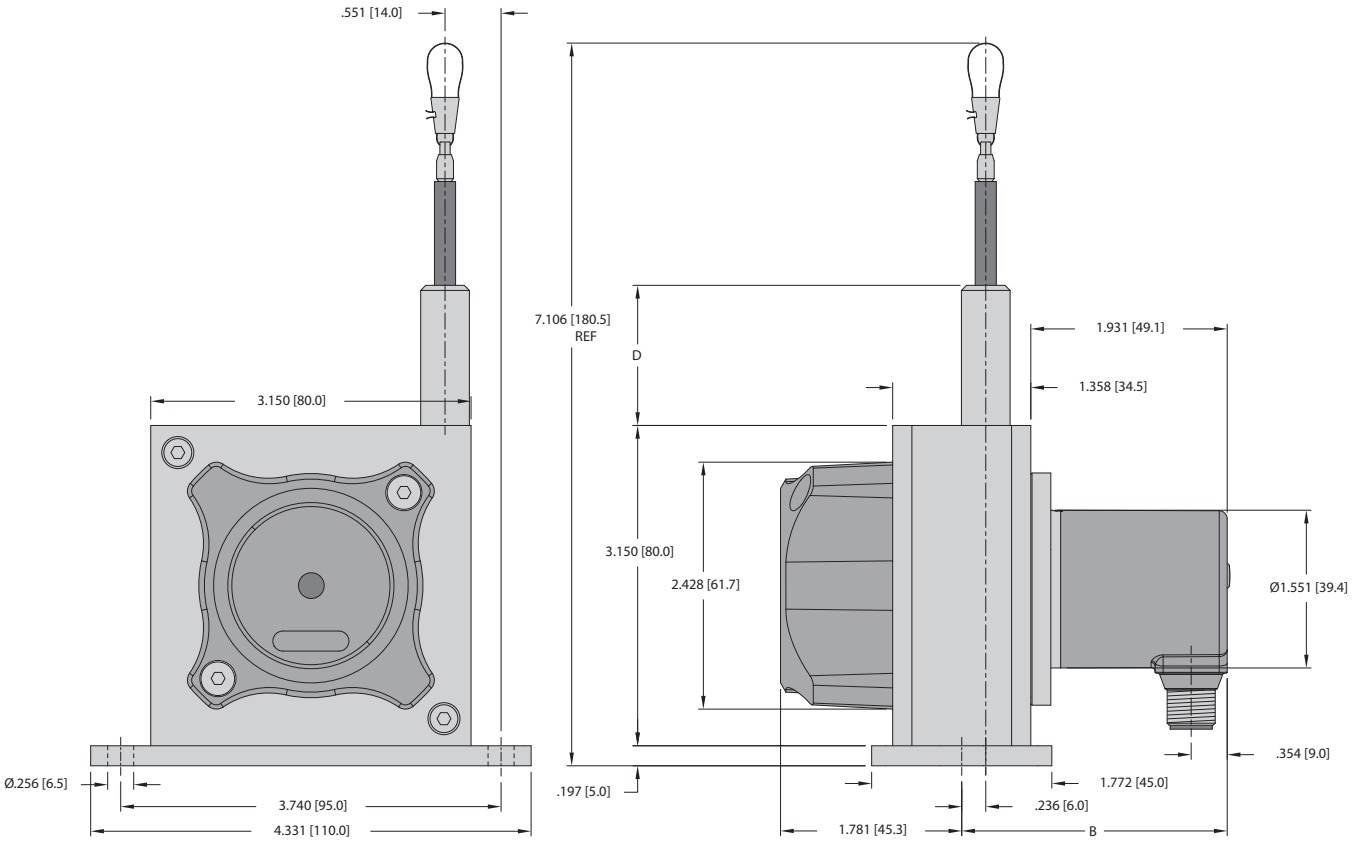


Mating Cordset:
RK 4.4T-*/S618

* Length in meters.

Draw Wire Encoder DW110

Dimensions: DW110 with Encoder (analog, scalable)



Dimension D depends on the measuring range of the draw wire

Measuring range	**D** in. [mm]
1000 mm	0.83 [21.0]
2000 mm	0.83 [21.0]
3000 mm	1.38 [35.0]

Dimension B depends on the encoder used

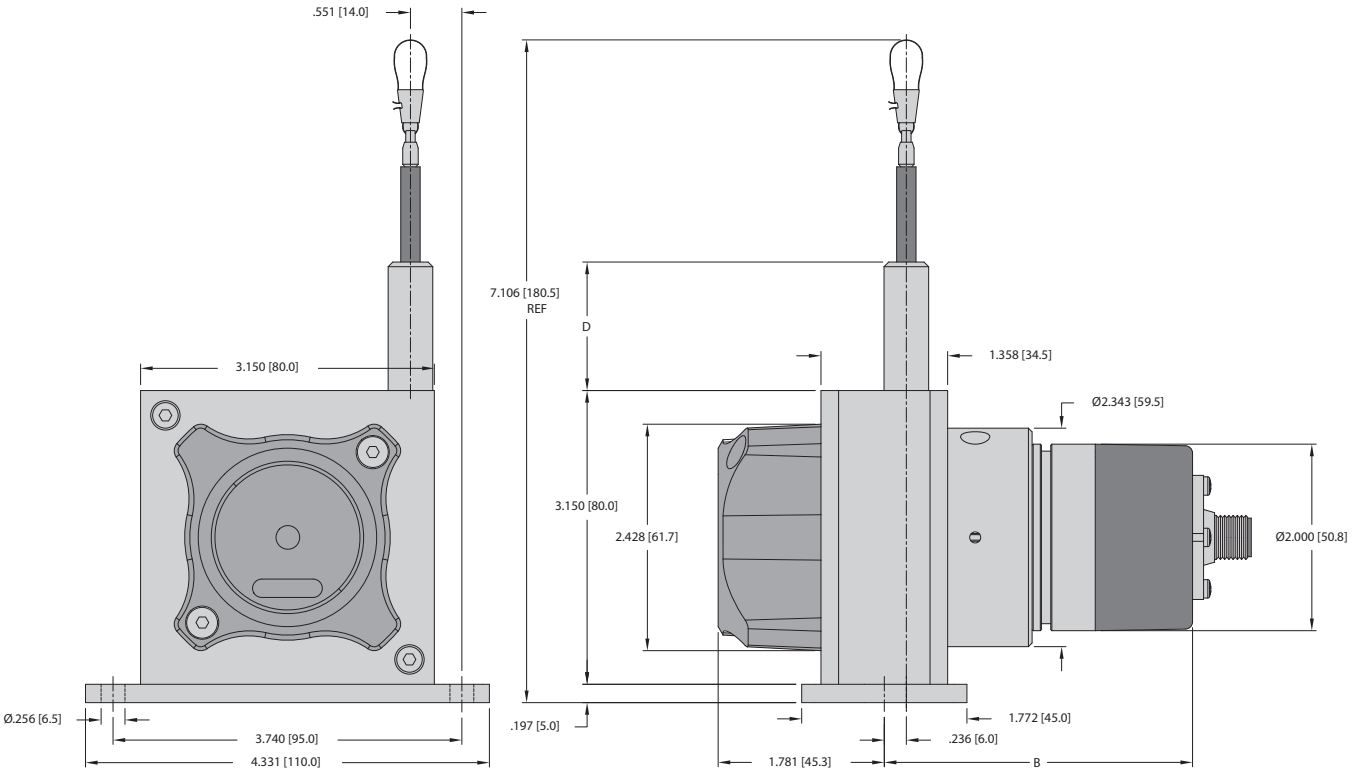
Encoder	Draw wire assembly	**B** in. [mm]
Incremental (RI-10)	DW****-110-10-******-*****	2.19 [55.75]
Absolute (RM-28)	DW****-110-28-******-*****	2.69 [68.25]
Absolute (RM-29)	DW****-110-29-******-*****	3.75 [95.35]
Absolute (RM-103)	DW****-110-103-******-*****	2.69 [68.25]
Absolute (RM-105) [EtherNet/IP]	DW****-135-105-******-*****	3.02 [76.75]
Absolute (RM-105) [CANopen]	DW****-110-105-******-*****	3.47 [88.25]
Absolute (RM-116)	DW****-110-116-******-*****	2.69 [68.45]
Absolute (RM-118)	DW****-110-118-******-*****	2.69 [68.45]
Absolute (RM-121)	DW****-110-121-******-*****	2.69 [68.45]

Accessories:

- See page H1, Connectivity, for cables and connectors

Draw Wire Encoder DW110

Dimensions: DW110 with Interchangeable Installation



Dimension D depends on the measuring range of the draw wire

Measuring range	**D** in. [mm]
1000 mm	0.83 [21.0]
2000 mm	0.83 [21.0]
3000 mm	1.38 [35.0]

Dimension B depends on the encoder used

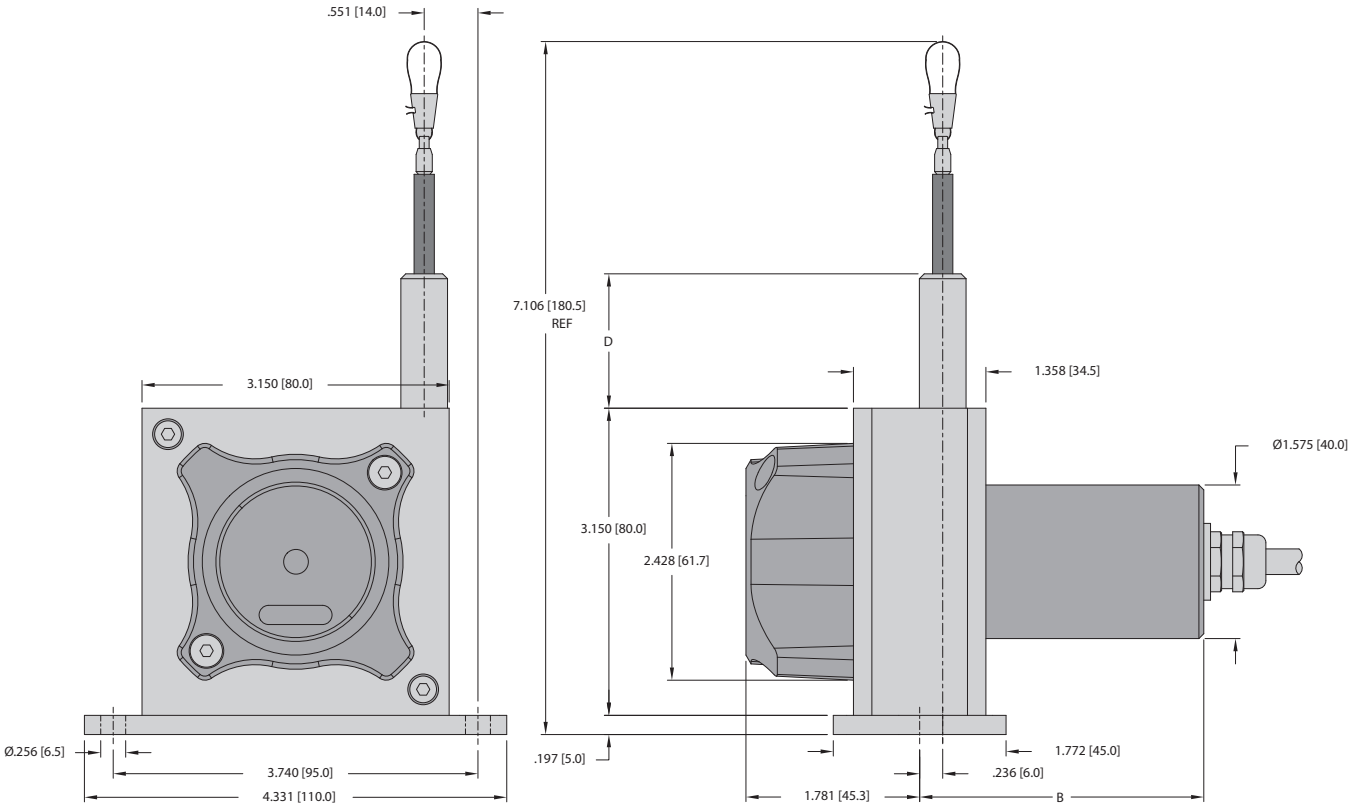
Encoder	Draw wire assembly	**B** in. [mm]
Incremental (RI-10)	DW****-110-10-******-*****	3.10 [78.75]
Absolute (RM-28)	DW****-110-28-******-*****	3.59 [91.25]
Absolute (RM-29)	DW****-110-29-******-*****	4.66 [118.35]
Absolute (RM-103)	DW****-110-103-******-*****	3.59 [91.25]
Absolute (RM-105) [EtherNet/IP]	DW****-135-105-******-*****	3.93 [99.75]
Absolute (RM-105) [CANopen]	DW****-110-105-******-*****	4.40 [111.25]
Absolute (RM-116)	DW****-110-116-******-*****	3.60 [91.45]
Absolute (RM-118)	DW****-110-118-******-*****	3.60 [91.45]
Absolute (RM-121)	DW****-110-121-******-*****	3.60 [91.45]

Accessories:

- See page H1, Connectivity, for cables and connectors

Draw Wire Encoder DW110

Dimensions: DW110 with Analog Sensor



Sensor type	Measuring length	B	D
Potentiometer	1000 mm	2.91 [74.0]	0.83 [21.0]
	2000 mm	2.91 [74.0]	0.83 [21.0]
	3000 mm	4.04 [102.5]	2.56 [65.0]
4-20mA 0-10V	1000 mm	3.44 [87.5]	0.83 [21.0]
	2000 mm	3.44 [87.5]	0.83 [21.0]
	3000 mm	4.03 [102.3]	3.09 [78.5]