

Non-Metallic Systems

CS90 – 90° Swivel External Male Thread Elbow Fitting

Technical Characteristics

Conforms to	BSI Kitemark KM-35161 Low voltage directive Lloyd's Register of Shipping (Type Approval) NFF 16-10/12 I4,F2		
Approvals and Standards	   		
Degree of mechanical protection	High Impact Resistance		
Degree of protection	IP66 - As standard IP67 - When fitted with ALS Seal IP68 - When fitted with ALS Seal (1.1 Bar 35 mins) IP69k - When fitted with ALS Seal		ALS Seal 
UV protection	Very High		
Fitting Characteristics		Straight fitting - Fixed external male thread Black (BL) as standard or Grey (GR) - RAL 7031	
Application	For insertion into thread entries or knockouts using a locknut to secure		
Normal operating temperature range	Application	Min Temp	Max Temp
	Static	- 50°C	+120°C
	Dynamic	- 45°C	+120 °C
For use with - Conduit Series	Light, Standard and Heavyweight variants of type PA , PI , CP , PR , PADL & PF		
Fire performance	Test Standard	Performance Rating	
	BS EN 61386	Approved	
	NFF16-101	I2 F4	
	ISO 4589-2	24%	
	BS EN 60695-2-11	850°C	
	UL94	V2	
Testing data	Click or See pages 4 & 5		
Type of material	Polyamide (Nylon) 66 Body- Nickel plated brass thread		
Image			

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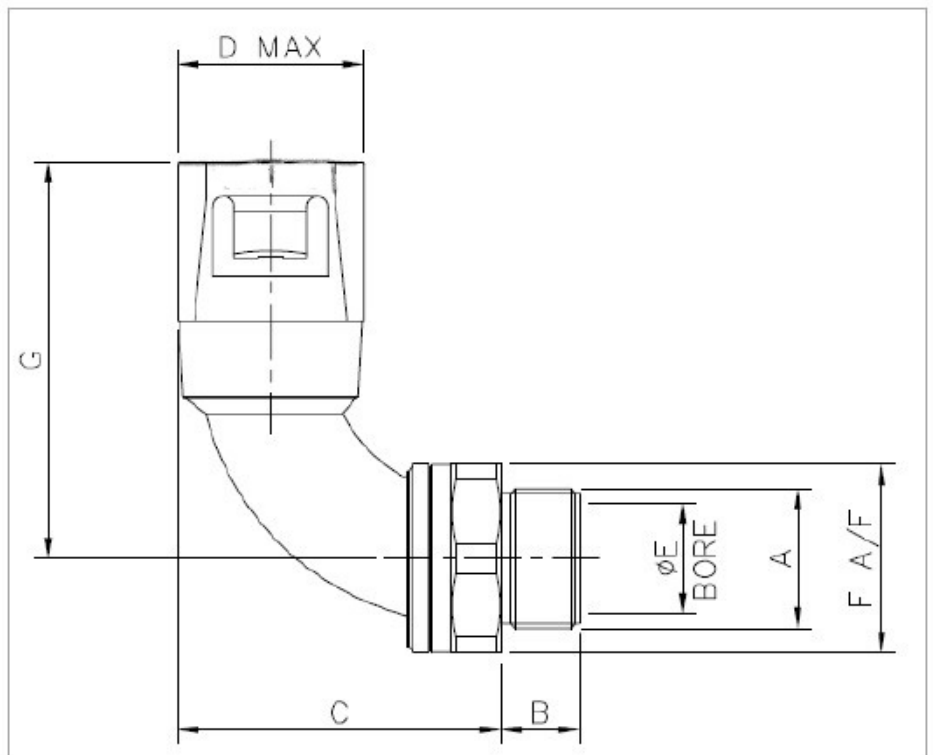
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Dimensional & Thread Data

Part No Black Body Metric Threads	Part No Grey Body Metric Threads	Thread A	Nominal Dimensions (mm)						Weight in grams (Each)
			B	C	D	E	F	G	
TAL13/M16/CS90/BL	TAL13/M16/CS90/GR	M16x1.5	12.0	45.4	21.2	11.2	24.0	53.2	33
TAL16/M16/CS90/BL	TAL16/M16/CS90/GR	M16x1.5	12.0	46.0	23.8	11.2	24.0	55.0	34
TAL21/M20/CS90/BL	TAL21/M20/CS90/GR	M20x1.5	11.2	46.8	29.1	15.2	27.0	56.9	41
TAL28/M25/CS90/BL	TAL28/M25/CS90/GR	M25x1.5	12.2	56.8	36.8	19.1	34.0	65.0	72
TAL34/M32/CS90/BL	TAL34/M32/CS90/GR	M32x1.5	17.0	68.8	43.2	26.4	42.0	74.2	112
TAL42/M40/CS90/BL	TAL42/M40/CS90/GR	M40x1.5	18.0	85.8	54.0	35.0	54.0	92.5	150
TAL54/M50/CS90/BL	TAL54/M50/CS90/GR	M50x1.5	16.0	108.6	66.8	45.0	70.0	115.0	293
TAL54/M63/CS90/BL	TAL54/M63/CS90/GR	M63x1.5	16.0	108.6	66.8	45.0	70.0	115.0	305

Metric	Standard thread conforming to EN60423 & BS3643		
Thread Size	Ext Thread Outside Diameter	Int Thread Inside Diameter	Pitch
M12	12mm	10.9mm	1.5mm
M16	16mm	14.4mm	1.5mm
M20	20mm	18.4mm	1.5mm
M25	25mm	23.4mm	1.5mm
M32	32mm	30.4mm	1.5mm
M40	40mm	38.4mm	1.5mm
M50	50mm	48.4mm	1.5mm
M63	63mm	61.4mm	1.5mm

NOTE: Dimensions are nominal



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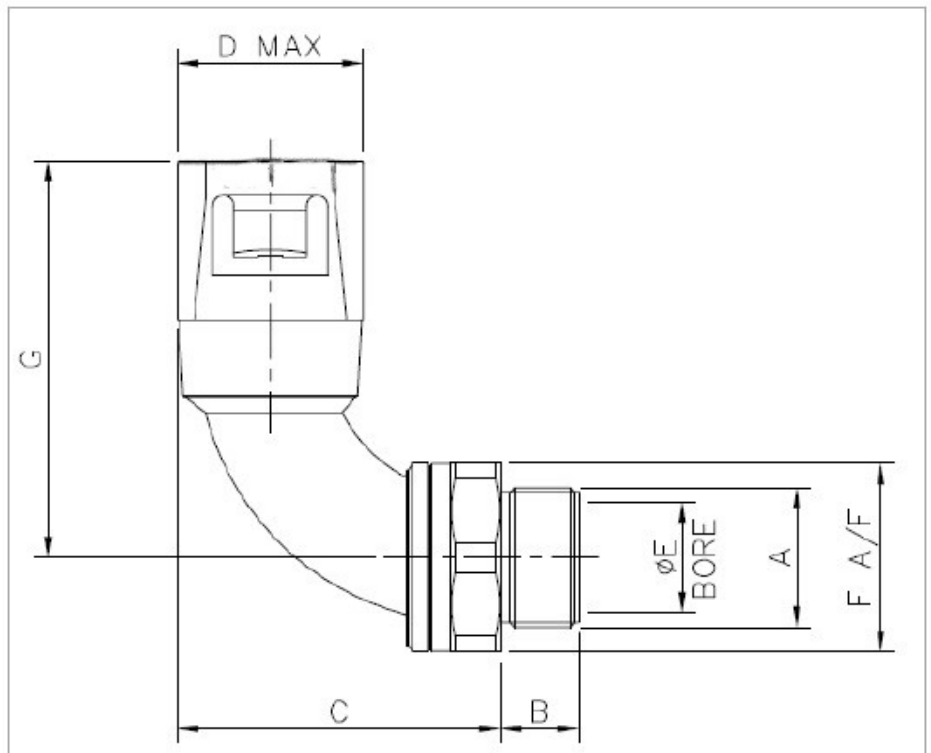
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Dimensional & Thread Data

Part No Black Body PG Threads	Part No Grey Body PG Threads	Thread A	Nominal Dimensions (mm)						Weight in grams (Each)
			B	C	D	E	F	G	
TAL13/PG9/CS90/BL	TAL13/PG9/CS90/GR	PG9	8.5	42.5	21.2	11.2	24.0	53.2	33
TAL16/PG11/CS90/BL	TAL16/PG11/CS90/GR	PG11	10.0	46.0	23.8	11.2	24.0	55.0	38
TAL21/PG13/CS90/BL	TAL21/PG13/CS90/GR	PG13.5	10.0	46.8	29.1	15.7	27.0	56.9	46
TAL21/PG16/CS90/BL	TAL21/PG16/CS90/GR	PG16	11.2	46.8	29.1	17.7	27.0	56.9	46
TAL28/PG21/CS90/BL	TAL28/PG21/CS90/GR	PG21	11.5	56.8	36.7	22.5	34.0	65.0	74
TAL34/PG29/CS90/BL	TAL34/PG29/CS90/GR	PG29	12.2	38.8	43.5	28.9	42.0	74.2	112
TAL42/PG36/CS90/BL	TAL42/PG36/CS90/GR	PG36	12.2	85.8	54.0	38.0	52.0	92.5	160
TAL54/PG48/CS90/BL	TAL54/PG48/CS90/GR	PG48	12.2	108.6	66.8	51.0	70.0	115.0	303

PG	German Standard Thread Conforming to DIN40430		
Thread Size	Ext Thread Outside Diameter	Int Thread Inside Diameter	Pitch
PG7	12.5mm	11.3mm	1.27mm
PG9	15.2mm	13.9mm	1.41mm
PG11	18.6mm	17.3mm	1.41mm
PG13.5	20.4mm	19.1mm	1.41mm
PG16	22.5mm	21.2mm	1.41mm
PG21	28.3mm	26.8mm	1.59mm
PG29	37mm	35.5mm	1.59mm
PG36	47mm	45.5mm	1.59mm
PG48	59.3mm	57.8mm	1.59mm

NOTE: Dimensions are nominal



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BS EN 61386 Classification

	Fitting	Compression	Impact	Min temp	Max temp	bending	electrical	IP solids	IP water	Corrosion	Tensile	Non-flame Propagating	Suspended load
	TAL	N/A	4	2	4	N/A	0	6	6	0	1	1	0

Mechanical Properties

Test Type	Methods / Standards	Requirements	Value
Tensile Strength	IEC61386-1	2 mins at Specified Value (<i>PAFS21 Conduit</i>)	Class 1
Tensile Strength		Ultimate Pullout (<i>PAFS21 Conduit</i>)	240N
Impact Strength @ -45°C	IEC61386-1	No visible damage	Class 1
Impact Strength @ -5°C	IEC61386-1	No visible damage	Class 3
Impact Strength @ 23°C	IEC61386-1	No visible damage	Class 5

Tensile Tests to IEC 61386 gives the minimum classification value only. Actual values will depend on the type and size of the fittings used and will always be greater than the minimum – Impact strength is the minimum classification value at the minimum temperature – actual values will depend on size and temperature. Specific values available on request.

Thermal Properties

Test Type	Methods / Standards	Requirements	Value
Dynamic Applications	IEC 61386-23	5000 Operations at MBR 2hrs	-45°C to +120°C
Static Short Term Temp		Temporary Use (3000hrs)	-50°C to +120°C
Static Long Term Temp		Permanent Use (30,000) Hours	-40°C to +105°C

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Flammability

Test Type	Method / Standard	Requirement	Result	Unit
Glow Wire	BS EN 60695-2-11	Extinguish within 30s	850°C	°C
Flammability	IEC 61386-1-12	1Kw Burner Flame to Self Extinguish	Pass	Pass/Fail
Oxygen Index	ISO 4589-2		24.1	%
Ignition Rating	NF F16-101	I Rating	I4	-

Smoke

Test Type	Method / Standard	Requirement	Result	Unit
Fume Rating	NF F16-101	F Rating	F2	-

Toxicity

Test Type	Method / Standard	Requirement	Result	Unit
Halogen Free	NFX 70-100	< 0.5%	Pass	Pass/Fail

Pre Test Conditions

Duration	Standard	Temperature	Relative Humidity
168 (Hours)	IEC61386	23 (°C)	50 (%)

Chemical Resistance Chart

Key:

Suitable :

Limited Suitability :

Unsuitable :

Not Tested :

Astm No.1	Diesel oil	Methyl Bromide	Sulphur Dioxide (Gas)
Astm No.2	Diethylamine	MEK	Sulphuric Acid (10%)
Astm No.3	Ethanol	Nitric Acid (10%)	Sulphuric Acid (70%)
Acetic Acid (10%)	Ether	Nitric Acid (70%)	Toluene
Acetone	Ethylamine	Oxalic Acid	Transformer Oil
Aluminium Chloride	Ethylene Glycol	Ozone (Gas)	1,1,1-Trichloroethane
Aniline	Ethyl Ethanoate	Paraffin oil	Trichloroethylene
Benzaldehyde	Freon 32	Petrol	Turpentine
Benzene	Hydrochloric Acid (10%)	Phenol	Vegetable Oil
Carbon tetrachloride	Hydrochloric Acid (36%)	Sea Water	Vinyl Acetate
Chlorine water	Hydrogen Peroxide (35%)	Silver Nitrate	Water
Chloroform	Hydrogen Peroxide (87%)	Skydrol	White Spirit
Citric Acid	Lactic Acid	Sodium Chloride	Zinc Chloride
Copper Sulphate	Lubricating oil	Sodium Hydroxide (10%)	
Cresol	Methanol	Sodium Hydroxide (60%)	

The information above is given as a guide only and is based on published technical data and experience. The chemical resistance of the above products is dependant on factors such as chemical exposure, concentration of the chemical and temperature. The above chemicals are valid for a temperature of 23°C. Use of the above table is at the users own discretion and risk. Those using it must satisfy themselves that their application presents no health and safety risks. The end user should assess compatibility with their application and contact TTS for further information.

ADHERENCE TO THE CURRENT WIRING REGULATIONS BS7671 OR NEC WIRING REGULATIONS (FOR USA) IS STRONGLY ADVISED.

MINIMUM BEND RADIUS FOR FLEXING IS DEPENDANT UPON MINIMUM TEMPERATURE, BENDING FREQUENCY AND CHEMICAL ENVIRONMENT.