



**BF series**

**ZF series**

**BA series**

modified phenolic resin backing, constantan alloy, encapsulated gauges with temperature compensation and creep compensation; high accuracy, good stability, for manufacturing precision transducers (0.02%FS)

modified phenolic resin backing, karma alloy, encapsulated gauges with temperature compensation and creep compensation (or modulus compensation); high accuracy, good stability, high resistance, small power loss, for manufacturing 0.02%FS accuracy transducers.

polyamide resin, constantan alloy, encapsulated gauges with temperature compensation, high elongation, wider operating temperature range, suitable for stress analysis under 150°C and building 0.05%FS accuracy transducers.

Specification	BF series	BA series	ZF series
nominal resistance(Ω)	350,650,1000	350,650,1000	350,650,1000
tolerance of resistance	<±0.1%	<±0.1%	<±0.1%
gauge factor	2.00~2.20	1.86~2.20	1.86~2.40
gauge factor resistance	<±1%	<±1%	<±1%
strain limit	2.0%	2.0%	2.0%
fatigue life	>10 <sup>7</sup>	>10 <sup>7</sup>	>10 <sup>8</sup>
effective modulus compensation	not available	not available	aluminum(23)
metal foil	constantan alloy	karma alloy	constantan alloy
creep compensation	available	available	available
working temperature range	-30~+80°C	-30~+150°C	-30~+80°C
temperature compensation	titanium(9), mild steel(11), stainless steel(16), aluminium(23), magnesium(27), plexiglass(65)		
curing temperature	135°C(curing process)	165°C(post curing process)	
bonding adhesives	H-610	H-610	H-610
soldering pad finishing	C, X,D,F,U,X**, BX**,Q**,G**	X, C,D,F,U,X**, BX**,Q**,G**	C, X,D,F,U,X**, BX**,Q**,G**
standard lead types	1. for strain gauges of BQ, BA, ZF series and patten of KA,BA,CA,BC,CB, CC,FD,AA-W,HA-W, the lead wire is round lead wire & length is 30±3mm. 2. for strain gauges of BE, BF, RNF, RBF series (except HA patten type), the lead wire is flat ribbon wire, and length is 30±3mm(for HA patten type,the wire length is 30±3mm). 3. if the user has special request for wire types and length, please indicate the code of wire type by referring to the ordering system.		



AA series



AB series



GB series



KA series



EB series



HA series

active gauge length in mm

gauge-grid and solder-tab geometry

gauge resistance in ohms

working temperature. limit

backing material

gauge S.T. C. or E. M.C. numbers

gauge types

gauge creep code

solder-tab & wiring

**B F 350 - 3 AA 80 (23) M6 - X**

B: foil type  
T: special purpose  
Z: Kama alloy

S. T. C. or E. M. C.

9: TITANIUM

11: Steel alloy

16: stainless steel

23: aluminum alloy

27: magnesium alloy

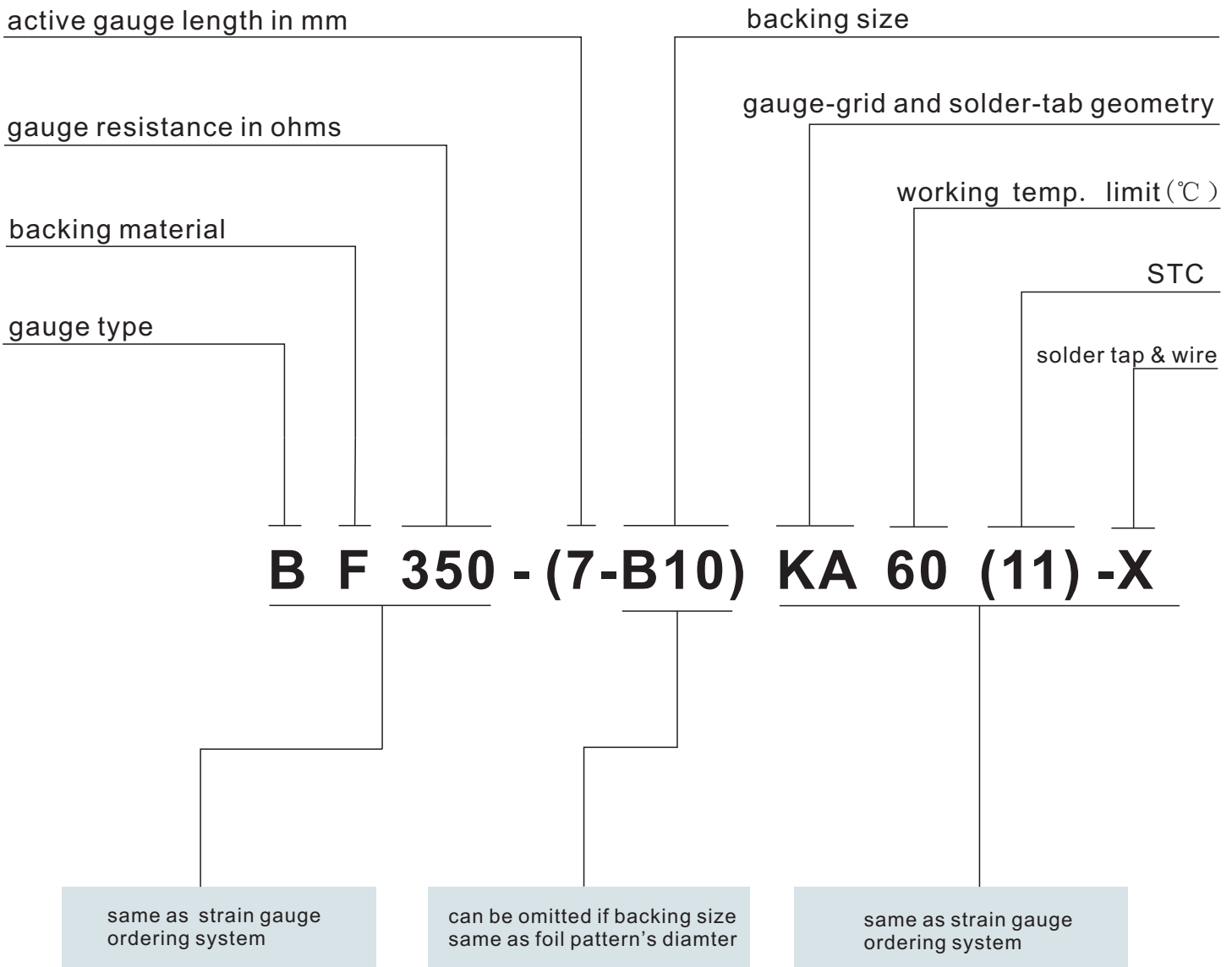
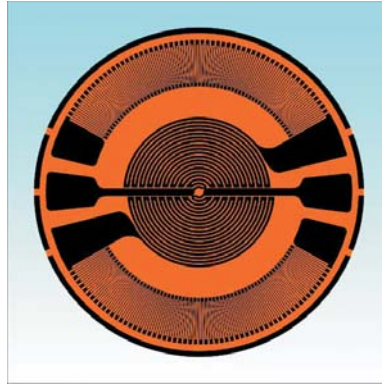
B: glass fibre reinforced polyimide  
F: modified phenolic resin  
A: polyimide resin  
E: phenolic acetal resin  
Q: paper-based acetal resin

X: sealed, standard wire  
D: sealed, tined solder dot  
C: naked solder pad  
U: naked with copper wire  
F: naked without wire  
X\*\*: sealed, round lead  
\*\* stand for lead length  
BX\*\*: sealed, flat ribbon  
\*\* stand for lead length  
Q\*\*: sealed, enamel insulated copper wire  
\*\* stand for wire length  
G\*\*: sealed, PTFE wire  
\*\*stand for wire length  
P\*\*: sealed, PVC wire  
\*\*stand for wire length

creep code:

M9, M8, M7, M6, M5, M4, M3, M2, M1,  
O1, O2, O3, O4, O5, O6, O7, O8, O9

# Coding System of KA Series Strain Gauges

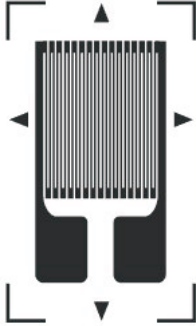


M9>M8>M7>M6>M5>M4>M3>M2>M1>O1>O2>O3>O4>O5>O6>O7>O8>O9

← creep →

\*: the difference in creep is 0.01~0.015%FS/30min between any two adjacent creep codes.

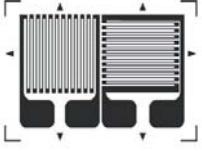
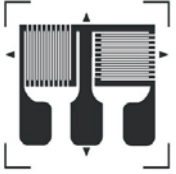

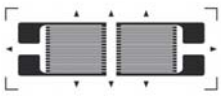

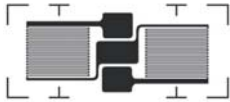

# Strain Gauges For Transducers Application

Gauge Pattern	Gauge Model	Gauge Grid(mm) Dimensions(L×M)	Gauge Backing(mm) Dimensions(L×M)	Gauge Creep Code	Grid Distance (mm)
	BF120-3AA(**)N*	2.8×2.0	6.4×3.5	M3,M2,M6,M5,M4	
	BF240-3AA(**)N*	3.2×3.06	7.4×4.4	M3	
	BF175-3AA(**)N*	4.0×2.2	8.0×3.6	M3	
	BF(BA)200-4AA(**)	2.8×2.0	6.4×3.5		
	BF(BA)200-6AA(**)	6.0×2.3	10.7×4.8		
	ZF(BA)300-1AA(**)	1.1×1.3	3.6×2.2		
	BF(BA)300-3AA(**)	2.9×1.8	5.5×2.5		
	BF(BA)350-1AA(**)N*	1.5×2.5	4.5×3.5	M6,M4,M3,M2,M1,O1, O2,O3,O4,O5,O6	
	BF(BA)350-2AA-A(**)	2.4×3.0	4.9×4.0		
	ZF350-2AA(**)N*	1.9×2.8	5.6×3.9	O5,O4,O2,M3,M2,M1,M5,M4	
	BF(BA)350-2AA-P(**)N*	2.0×2.4	5.0×3.5	M4,O1,O2,O3,O4,O5,O6	
	BF(BA)350-2AA(**)N*	2.5×3.3	6.5×4.5	M9,M8,M7,M6,M5,M4,M3,M2, M1,O1,O2,O3,O4,O5,O6	
	ZF1000-2AA(**)N*				
	BF700-3AA(**)T*	3.2×3.06	7.4×4.4		
	ZF1000-3AA-B(**)N*	3.0×3.1	14.3×4.5	M8,M6,M7,M6,O1,M5, O5,M4,O6,O2,O3	
	ZF350-3AA-B(**)N*				
	BF350-3AA-A(**)N*	3.2×1.57	6.9×3.1	M3,M2	
	BF(BA)350-3AA(**)N*	3.2×3.1	7.4×4.4	M9,M8,M7,M6,M5,M4,M3,M2, M1,M0,O1,O2,O3,O4,O5	
	ZF1000-3AA(**)N*	3.2×3.2	7.4×4.5		
	ZF350-3AA(**)N*	3.1×2.62	7.4×4.0	O4,O2,M2,M7,M1,M6,O1,M5,M4	
	BF(BA)350-4AA(**)N*	3.8×2.7	8.2×4.2	M9,M8,M7,M6,M5,M4,M3,M2, M1,O1,O2,O3,O4,O5,O6	
	ZF1000-4AA(**)N*				
	ZF1500-3AA(**)N*	3.2×3.16	7.4×4.5	O4,M3	
	BF(BA)350-5AA(**)N*	5.0×2.9	9.3×4.5		
	ZF1000-5AA(**)N*				
	BF(BA)350-6AA(**)	6.1×3.1	10.4×5.4		
	BF(BA)500-4AA(**)	4.0×3.3	7.9×4.6		
	BF(BA)600-4AA(**)	4.2×4.0	8.6×5.8		
	BF(BA)650-4AA(**)	4.0×4.4	8.6×6.0		
	BF(BA)650-5AA(**)	5.0×3.9	9.0×5.6		
	BF(BA)650-6AA(**)	5.8×4.4	10.4×6.4		
	ZF1000-1.5AA(**)T*	1.5×4.0	4.9×5.2	O6	
	ZF1000-1.5AA-A(**)N*	1.5×2.5	4.5×3.1	O6	
	BF1000-2AA(**)N*	2.2×4.6	5.8×5.8	M4,M2,O5,O6	
	ZF1000-2AA-A(**)T*	2.1×3.3	5.8×4.5	O6	
	BF(BA)1000-3AA(**)T*	3.0×5.3	6.7×6.5	M6,M5,M3,M2,M1,O2,O3,O5	
	BF(BA)1000-4AA(**)N*	4.0×4.3	7.7×5.5	M6,M5,M3,M2,M1,O2,O3,O5	
	BF(BA)1000-6AA(**)	6.0×4.0	9.9×5.4		
	ZF2000-2AA(**)N*	2.0×3.0	5.6×4.5	O5	
	ZF2000-2AA-A(**)T*	2.1×4.2	5.4×5.2	O5	
ZF2000-3AA(**)T*	3.2×4.0	7.4×5.3	O4		
ZF2500-3AA(**)N*	3.2×3.2	7.4×4.5	M4,M3,M2,M1,O1,O2,O3, O4,O5,O6		
ZF3000-5AA(**)N*	5.2×4.0	8.7×5.2	M2		
ZF3000-6AA(**)T*	6.1×3.9	9.8×5.2	O4		


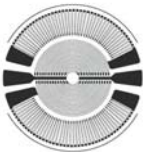


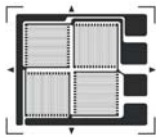
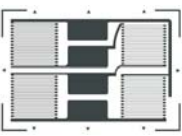
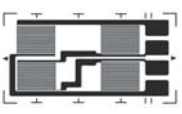
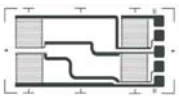
# Strain Gauges For Transducers Application

Gauge Pattern	Gauge Model	Gauge Grid(mm) Dimensions(L×M)	Gauge Backing(mm) Dimensions(L×M)	Gauge Creep Code	Grid Distance (mm)
	BF(BA)350-2HA-D(**)	2.0×3.8	8.8×5.6		
	BF(BA)350-3HA-D(**)N*	3.0×5.2	8.8×6.8	M3,M1,O2,O4,O6	
	BF(BA)350-4HA-D(**)N*	4.0×6.5	6.9×8.2		
	ZF700-4HA(**)T*	3.8×6.1	7.5×7.5	O2	
	BF350-2HA-E(**)	2.0×3.8	8.8×5.6		
	BF(BA)350-3HA-E(**)N*	3.0×5.2	8.8×6.8	M3,M1,O2,O4,O6	
	BF(BA)350-4HA-E(**)N*	4.0×6.5	6.9×8.2		
	BF(BA)350-6HA-E(**)	6.0×10.0	11.0×10.5	O2	
	ZF700-4HA-E(**)T*	3.8×6.1	7.5×7.5		
	BF(BA)350-2HA(**)N*	2.0×3.7	9.0×5.6		
	BF(BA)350-3HA(**)N*	3.1×5.5	9.4×6.7		
	ZF1000-3HA(**)N*	3.1×5.5	9.4×6.7	M3,M1,O1,O2,O4,O6	
	BF(BA)350-4HA(**)N*	3.8×6.0	9.0×7.8		
	ZF1000-4HA(**)N*	3.8×6.0	9.0×7.8		
	BF(BA)350-6HA(**)	5.8×9.1	10.5×10.8		
	BF1000-3HA(**)N*	3.0×6.2	9.7×6.2	M3,M1,O2,O3	
	BF(BA)350-2HA-A(**)N*	2.0×3.7	9.0×5.6		
	BF(BA)350-3HA-A(**)N*	3.1×5.5	9.4×6.7		
	ZF1000-3HA-A(**)N*	3.1×5.5	9.4×6.7	M3,M2,M1,O1,O2,O4,O6	
	BF350-4HA-A(**)N*	3.8×6.0	9.0×7.8		
	ZF1000-4HA-A(**)N*	3.8×6.0	9.0×7.8		
	BF(BA)350-6HA-A(**)	5.8×9.1	10.5×10.8		
	BF350-2HA-B(**)N*	2.0×3.7	9.5×5.6		
	BF350-3HA-B(**)N*	3.0×5.5	9.4×6.7		
	BF350-5HA-B(**)N*	4.7×8.1	15.7×9.6	M1	
	BF350-2HA-C(**)N*	2.0×4.9	7.2×6.3	M1,O4,O2,O6	
	BF350-3HA-C(**)N*	3.0×6.5	9.4×7.7		
	BF1000-3HA-C(**)N*	3.0×6.6	10.7×7.8	M3,M2,M1,O1,O2,O4	
	BF60-3AB(**)T*	3.0×3.0	8.2×5.1	O2	
	BF175-2AB(**)T*	2.0×2.0	6.7×3.7	O2	
	BF175-2AB	3.0×3.0	8.2×5.1	M3	
	BF(BA)350-3AB(**)	4.2×4.0	8.2×5.1		
	ZF1000-3AB(**)	4.2×4.0	8.2×5.1		
	BF(BA)350-4AB(**)	5.6×4.4	9.1×5.8		
	ZF1000-4AB(**)	5.6×4.4	9.1×5.8		
	BF(BA)350-6AB-(**)	6.0×6.0	12.0×8.3		
	BF(BA)350-2FB(**)	2.0×2.8	6.4×7.6		
	BF(BA)350-3FB(**)N*	3.2×2.8	7.4×7.4	M4,O1,O2	
	BF(BA)350-3FB(**)	2.9×2.6	7.4×7.2		
	BF(BA)350-4FB(**)	4.0×2.4	8.2×6.8		
	BF(BA)350-6FB(**)	5.2×4.0	9.8×7.3		
	BF350-3AB-C(**)	3.0×3.0	8.2×5.1	O5	

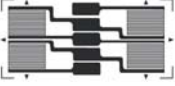

# Strain Gauges For Transducers Application

Gauge Pattern	Gauge Model	Gauge Grid(mm) Dimensions(L×M)	Gauge Backing(mm) Dimensions(L×M)	Gauge Creep Code	Grid Distance (mm)
	BF(BA)350-2BB(**)	2.2×2.8	8.0×6.0		
	BF(BA)350-3BB(**)	3.0×3.4	8.6×6.6		
	ZF1000-3BB(**)	3.0×3.4	8.6×6.6		
	BF(BA)350-4BB(**)	4.0×4.1	9.7×7.7		
	BF(BA)350-6BB(**)	5.8×6.5	14.4×10.0		
	BF(BA)600-4BB(**)	3.9×4.1	9.7×9.7		
	BF(BA)350-2BB-A(**)	2.1×2.6	6.9×5.9		
	ZF350-2BB-A(**)	1.8×2.2	5.4×6.4		
	BF(BA)350-3BB-A(**)	3.0×3.4	9.8×6.8		
	ZF1000-3BB-A(**)	3.0×3.4	9.8×6.8		
	BF(BA)350-4BB-A(**)	4.0×4.2	10.0×7.8		
	BF(BA)350-6BB-A(**)	6.0×6.1	14.4×10.0		
	BF(BA)600-5BB-A(**)	4.9×3.2	9.6×9.8	O2	
	BF(BA)700-5BB-A(**)	4.9×3.2	9.6×9.8	O2	
	BF(BA)350-2GB(**)	2.1×3.0	10.8×4.4		
	BF(BA)350-3GB(**)	3.1×2.8	12.4×4.4		
	BF(BA)350-4GB(**)	4.0×3.7	16.8×5.8		
	BF(BA)350-3GB-AL0(**)	2.9×3.0	15.4×4.1		
	BF(BA)500-2GB-AL6(**)	2.1×5.0	9.8×6.0		
	ZF1000-3GB-AL0(**)	3.3×3.0	15.4×4.4		
	BF(BA)350-1GB(**)N*	1.5×2.5	13.8×3.8	M4,M3,M2,M1,O1,O2	10.5
	ZF350-1GB-AL*-M23-N*	1.5×3.0	(L1+3.0)×4.2	M4,M2,O1,O2	6.8,8.0
	BF(BA)350-2GB-A(**)	2.0×3.0	10.8×4.4	M4,M2,O1,O2	7.0
	BF(BA)750-3GB-AL*(**)-N*	3.0×3.5	(L1+4.8)×4.3	M4,O2	10.5,12.0 14.0
	ZF1000-1.5GB-AL9(*)-T(**)	1.5×4.0	12.0×5.2	O3,O4	
	ZF1000-1.6GB-AL0-M23-N*	1.6×3.9	14.0×5.2	M4,M2,O1,O2,O4	10.5
	ZF1000-2GB-AL0(**)T*	2.5×3.3	14.7×4.5	O3,O4	
	ZF1000-2GB-AL6(**)T*	2.0×2.8	9.4×3.8	M4,O1,O2,O4	6.0
	BF500-2GB-BL8-T0	2.1×5.3	11.3×8.3		8.0
	BF500-3GB(**)N*	3.0×4.1	12.0×5.4	M2	7.0
	ZF1000-2GB-BL6-M23-N*	2.1×4.1	9.7×5.5	O1,O2,O5	6.0
	BF1000-3GB-BL7(**)-N*	3.0×5.5	11.6×6.5		7.0
	ZF1000-2GB-BL7-M23-N6	2.1×4.1	10.7×5.5		7.0
	ZF2000-2GB-BL7-T0	2.1×5.4	10.8×6.4		7.0
	BF350-(9)KA(**)	Ø9.0	Ø10.0		
	BF350-(10)KA(**)	Ø9.0	Ø10.0		
	ZF1000-(10)KA(**)	Ø9.0	Ø10.0		
	BF350-(15)KA(**)	Ø14.0	Ø15.0		
	ZF1000-(15)KA(**)	Ø14.0	Ø15.0		
	BF350-(20)KA(**)	Ø19.0	Ø20.0		
ZF1000-(20)AA(**)	Ø19.0	Ø20.0			

# Strain Gauges For Transducers Application

Gauge Pattern	Gauge Model	Gauge Grid(mm) Dimensions(L×M)	Gauge Backing(mm) Dimensions(L×M)	Gauge Creep Code	Grid Distance (mm)
	ZF350-(20)KA(**)	Ø19.0	Ø20.0		
	ZF1000-(7)KA(**)	Ø7.0	Ø9.9		
	ZF1000-(13)KA(**)	Ø12.0	Ø13.0		
	ZF1000-(13)KA(**)-D	Ø9.4	Ø13.0		
	ZF1000-(14)KA(**)	Ø13.0	Ø14.0		
	ZF1000-(14)KA(**)-D	Ø12.8	Ø14.0		
	ZF1650-(13)KA(11)-D	Ø9.8	Ø13.0		
	ZF2000-(14)KA(11)-D	Ø13.6	Ø14.0		
	ZF2000-(17)KA(**)	Ø16.8	Ø17.0		
	ZF1500-(10)KA(**)	Ø9.0	Ø10.0		
	ZF1500-(11)KA(**)	Ø9.0	Ø11.0		
	ZF2000-(18)KA(**)	Ø17.8	Ø18.0		
	ZF350-(6)KA-B(**)	Ø5.3	Ø6.0		
	ZF1000-(10)-B(**)	Ø9.0	Ø10.0		
	ZF500-(6)KA-B(**)	Ø5.3	Ø6.0		
	ZF2000-(12)KA-B(**)	Ø11.8	Ø12.0		
	ZF1500-(16)KA-C(**)	Ø13.5	Ø16.0		
	ZF350-(20)KA-C(**)	Ø19.0	Ø20.0		
	ZF1000-(20)KA-C(**)	Ø19.0	Ø20.0		
	BF350-(20)KA-C(**)	Ø19.0	Ø20.0		
	ZF2000-(13-B16)KA-C(**)	Ø13.5	Ø16.0		
	BF350-2EB-B(**)	2.3×2.7	8.6×7.4		
	ZF1000-2EB-B(**)	2.3×2.7	8.6×7.4		
	ZF300-2EB(**)	1.8×2.2	8.5×7.3		
	BF350-2EB(**)	2.3×2.7	8.6×7.1		
	ZF1000-2EB(**)	2.3×2.7	8.6×7.1		
	BF350-1FG-BL0(**)-T*	1.5×2.8	13.5×6.2	M4, M3, M2, M1, O1, O2, O3, O4, O5, O6	10.5
	ZF350-1FG-BL*M23-N*	1.5×2.3	(L1+3.8)×6.2		6.0
	ZF1000-1.5FG-BL0-T*	1.5×2.8	14.1×6.9		10.5
	ZF1000-2FG-BL*-M23-N*	2.1×2.8	(L1+4.3)×6.9		10.5
	BF350-3FG-BL0(**)-T*	3.1×2.8	15.3×6.8		6.0, 10.5
	ZF1000-3FG-BL0-M23-T*	3.1×2.8	15.3×6.8		10.5
	ZF2000-2FG-BL0-M23-T*	2.0×3.3	14.6×7.8		10.5
	ZF350-1FG-L0(**)-T*	1.5×2.4	14.4×6.4	M4, M3, M2, M1, O1, O2, O3, O4, O5, O6	10.5
	BF350-2FG-L0(**)-T*	2.0×2.7	14.6×6.9		10.5
	ZF350-2FG-L*(-**)-T*	2.0×2.5	(L1+4.5)×6.4		7.0, 8.8, 10.5
	ZF1000-3FG-L*-M(**)-N*	3.0×2.5	(L1+7.1)×6.6		10.5, 12.0
	BF350-3FG-AL4(**)-N*	3.0×2.1	20.5×6.8	M2, O5	14.0
	ZF1000-3FG-AL4(**)-N*	3.0×2.1	20.5×6.8	M2, O5	14.0

# Strain Gauges For Transducers Application

Gauge Pattern	Gauge Model	Gauge Grid(mm) Dimensions(L×M)	Gauge Backing(mm) Dimensions(L×M)	Gauge Creep Code	Grid Distance (mm)
	BF350-3FG-CL0(**)-T*	3.1×2.6	15.4×7.0	O1,O3,O4	10.5
	ZF1000-3FG-CL0(**)-T*	3.1×2.6	15.4×7.0	O1,O3,O4	10.5
	ZF350-1FG-CL*-M(**)-N*	1.5×2.3	(L1+3.1)×6.2		6.8,10.5
	ZF1000-(13)KA(**)-D	Ø9.4	Ø13.0		

explanation :

1. the code "N\*, T\*" in gauge part number is creep code, different code for different creep.

2. the code "L\*" is grid center distance code, for example, "L10.5" means the grid center distance is 10.5mm, and "L6" means the grid center distance is 6.0mm.

3. For gauge part number like "BF(BA)350-3AA(\*\*)", this stands for two series strain gauges, one is "BF350-3AA(\*\*)", another is "BA350-3AA(\*\*)".

4. For encapsulated strain gauges with parttern types of "HA-D" "HA-E", we only provide strain gauges with lead wires.

5. For strain gauges with pattern type of "KA":

if nominal resistance=350Ω, then resistance range: nominal value Ω, the difference in resistance is  $\leq 0.8\Omega$  between any two grids for one strain gauge.

if nominal resistance=1000Ω, then resistance range: nominal value Ω, the difference in resistance is  $\leq 1.0\Omega$  between any two grids for one strain gauge.

if nominal resistance  $\geq 1500\Omega$ 时, then resistance range: nominal value Ω, the difference in resistance is  $\leq 0.1\%$  of nominal value.