



- **Cinescopi per televisione bianco - nero**
- **Tubi a raggi catodici per visualizzatori d'informazioni**
- **Black and white picture tubes**
- **Monochrome cathode ray tubes for monitor and display applications**



La Società FIVRE produce tubi a raggi catodici per televisione in bianco e nero, fino dal 1952.

Da allora molti milioni di cinescopi sono stati prodotti e venduti nei mercati nazionali ed esteri.

La lunga esperienza, l'alta qualità dei suoi prodotti e la flessibilità delle sue linee produttive hanno permesso alla FIVRE di entrare con successo anche nel settore dei tubi per la visualizzazione dell'informazione.

Seguire l'evoluzione tecnologica di questo settore costituisce uno degli obiettivi primari della FIVRE.

FIVRE manufactures cathode ray tubes for black and white television from 1952.

Since, several million of cathode ray tubes have been manufactured and sold on the home and export markets.

The long experience, the high quality of its products and the flexibility of its production lines have enabled FIVRE to establish itself successfully also in the field of cathode ray tubes for high performance video and data display.

One of FIVRE's primary aim is to maintain its position at the forefront of technological development in this field.

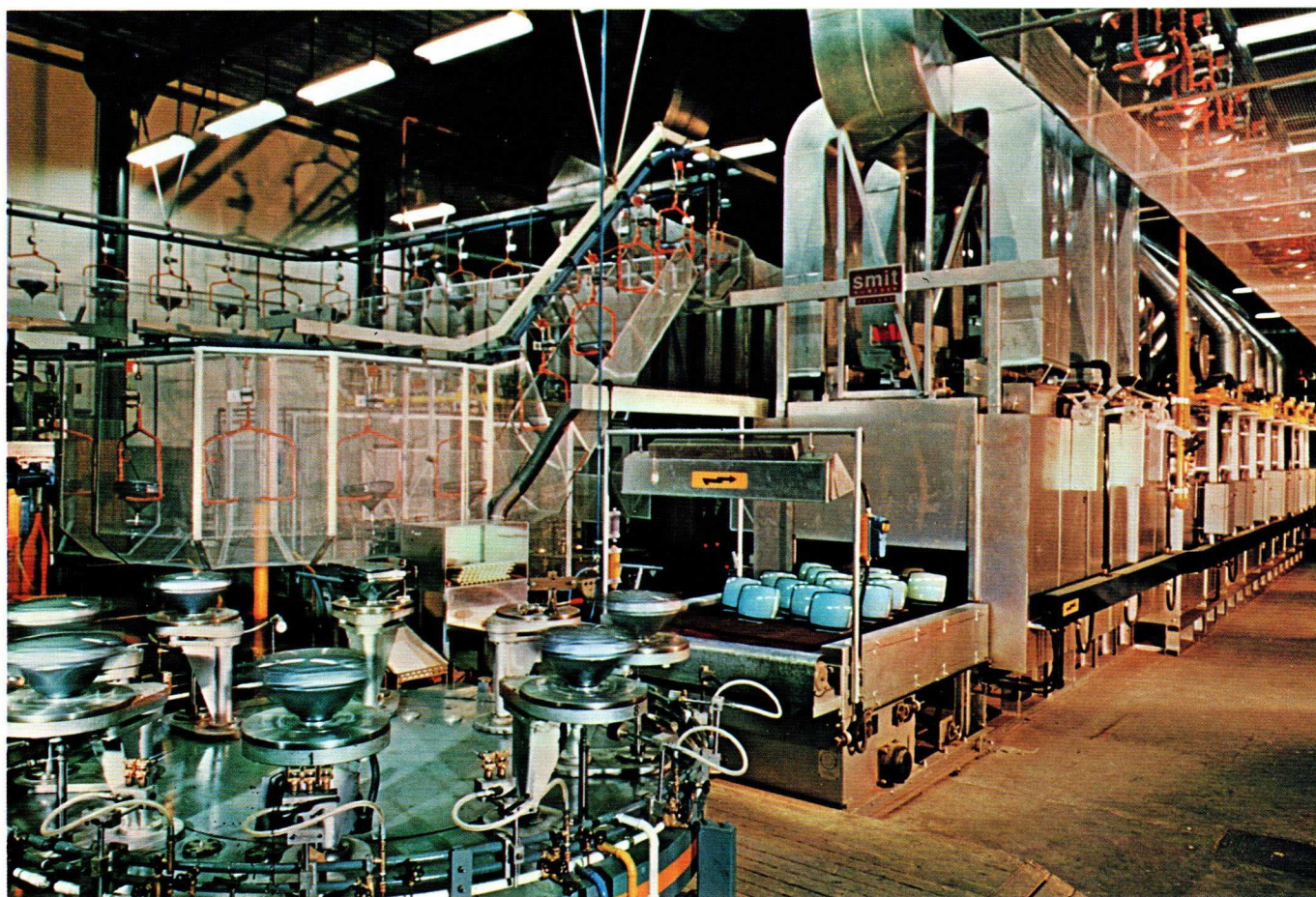


Foto 1 - Particolari di una linea di produzione
View of a production line



Foto 2 - Operazione di assemblaggio cannoni elettronici
Electron gun assembly operation

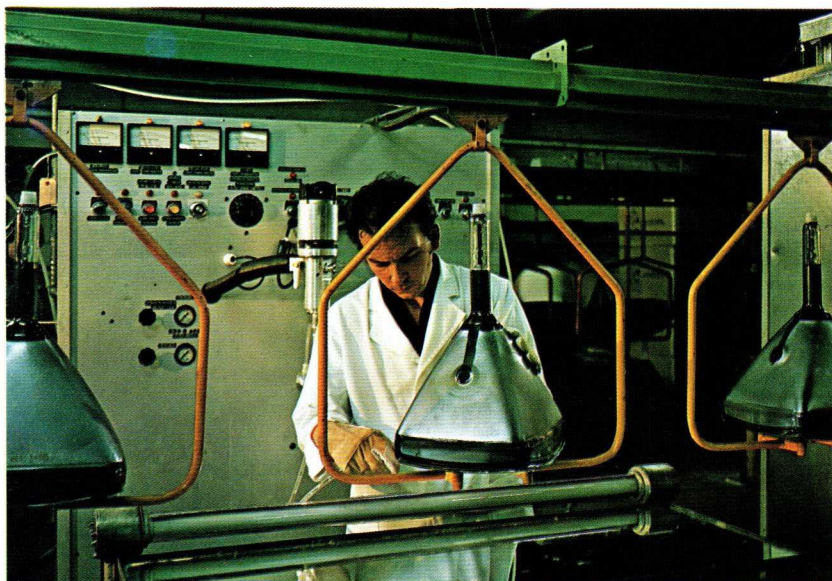


Foto 3 - Macchina iniezione resina per applicazione del pannello di protezione
su tubi a raggi catodici per visualizzatori d'informazioni
Safety panel bonding equipment



Foto 4 - Strumentazione di laboratorio per misure spettrofotometriche
e di risoluzione
Laboratory instrumentation for spectrophotometric and resolution
measurements

Caratteristiche generali dei cinescopi per televisione e per visualizzatori d'informazioni:

1) Schermi rettangolari - 2) Schermi alluminati - 3) Contatto anodico JEDEC J1-21 - 4) Protezione antimpiosione secondo Norme I.E.C. 65, variante 2, paragrafo 18 - 5) Emissione di raggi X inferiore al valore di 0,5 mR/h misurata a Norme I.E.C. 65, 3^a edizione, con condizioni di funzionamento entro i valori massimi prescritti.

Common features of black and white TV picture tubes and CRTs for monitor and display applications:

1) Rectangular faceplates - 2) Aluminised screens - 3) J1-21 side contact - 4) Implosion protection as per I.E.C. publication No. 65, amendment 2, par. 18 - 5) Radiation level below the acceptable value of 0,5 mR/h measured as per I.E.C. publication No. 65, 3rd. edition, when the operation is within maximum ratings.

CINESCOPI PER TELEVISIONE BIANCO - NERO

BLACK AND WHITE TV PICTURE TUBES

Caratteristiche comuni: Focalizzazione elettrostatica - Deflessione magnetica

Common features : Electrostatic focus - Magnetic deflection

Diagonale faccia (pollici) Face diagonal (inch)	T I P O T Y P E	Angolo di deflessione Deflection Angle	Diametro collo Neck diameter (mm)	Protezione antimplosione Implosion protection	Zoccolo Base (JEDEC)	Dimensioni e connessioni Dimensional outline and basing	Trasparenza nominale vetro Nominal screen glass transmission %	Filamento Heater		Condizioni tipiche di funzionamento Typical operation			NOTE NOTES
								V	mA	Anodo Anode (KV)	Griglia 2 Grid n. 2 (V)	Fuoco Focus (V)	
12"	A31-19W / 12BM219	90°	20,0	T-band	E7-91	Fig. 7	49	11,0	70	12	250	0 / 350	1) Il sistema di protezione antimplosione è previsto con orecchiette di fissaggio. 2) Il tipo 23" è fornibile anche senza fascia di protezione (A59-15W/23DFP4S). 3) A richiesta possono essere forniti tubi con valori di tensione di griglia 2 e fuoco diversi da quelli indicati.
	A31-120W / 12BM121	110°	20,0	T-band	E7-91	Fig. 6	49	11,0	70	12	250	0 / 350	
	A31-123W / 12BM123	110°	20,0	T-band	E7-91	Fig. 6	49	11,0	70	12	250	0 / 350	
15"	A37-110W / 15BM120	110°	20,0	T-band	E7-91	Fig. 10	49	11,0	70	12	250	0 / 350	
17"	A44-124W / 17BM4	114°	28,6	T-band	B7-208	Fig. 17	46	6,3	300	18	400	0 / 400	
	A44-282W/S	110°	20,0	T-band	E7-91	Fig. 16	48	11,0	70	14	130	0 / 130	
	A44-282W / 17BM122	110°	20,0	T-band	E7-91	Fig. 16	48	11,0	70	14	250	0 / 400	
20"	A50-120W / 20BM1	114°	28,6	Metal frame	B7-208	Fig. 19	44	6,3	300	18	400	0 / 400	
	A50-280W / 20BM120	114°	20,0	Metal frame	E7-91	Fig. 18	44	11,0	70	14	250	0 / 350	
23"	A59-23W / 23BM2	110°	28,6	Metal frame	B7-208	Fig. 21	42	6,3	300	18	400	0 / 400	
24"	A61-120W / 24BM1	110°	28,6	Metal frame	B7-208	Fig. 20	42	6,3	300	18	400	0 / 400	
	A61-123W / 24BM3	110°	28,6	Metal frame	B7-208	Fig. 20	42	6,3	300	18	400	0 / 400	
	A61-124W / 24BM4	110°	28,6	Multilayer band	B7-208	Fig. 20	42	6,3	300	18	400	0 / 400	

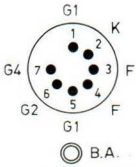
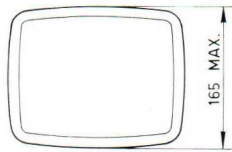
TUBI A RAGGI CATODICI PER VISUALIZZATORI D'INFORMAZIONI

Caratteristiche comuni: Focalizzazione elettrostatica - Deflessione magnetica

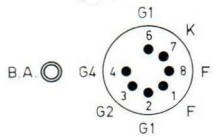
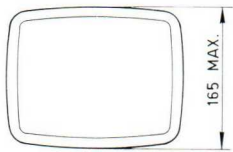
MONOCHROME CATHODE RAY TUBES FOR MONITOR AND DISPLAY APPLICATIONS

Common features : Electrostatic focus - Magnetic deflection

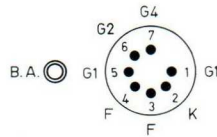
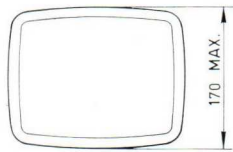
Diagonale faccia (pollici) Face diagonal (inch)	T I P O (a) T Y P E (a)	Angolo di deflessione Deflection angle	Diametro collo Neck diameter (mm)	Protezione antimplosione Implosion protection	Zoccolo Base (JEDEC)	Dimensioni e connessioni Dimensional outline and basing	Trasparenza nominale vetro Nominal screen glass transmission %	Area utile dello schermo Usefull screen area (mm x mm)	Filamento Heater		Condizioni tipiche di funzionamento Typical operation			Risoluzione (largh. riga) Resolution (line width) (mm)	NOTE NOTES
									V	mA	Anodo Anode (KV)	Griglia 2 Grid n. 2 (V)	Fuoco Focus (V)		
9"	M23-190T-..	90°	20,0	T-band	E7-91	Fig. 1	53	140 x 183	11,0	70	12	400	0 / 350	0,21 (c)	a) Δ = indica il trattamento antiriflettente del pannello di vetro: E = trattamento antiriflettente per corrosione (JEDEC 66/A) F = trattamento antiriflettente per corrosione fine C = trattamento antiriflettente per deposizione ○ = indica la trasparenza del pannello di vetro: 3 = trasparenza 31 % 6 = trasparenza 61 % 9 = trasparenza 92 % .. = indicano il tipo di fosforo (v. pag. 10) Esempio: un tubo per monitor da 12", collo 28,6 mm., angolo deflessione 90°, protezione antimplosione T-band con pannello di vetro con trattamento antiriflettente per corrosione, trasparenza 61%, fosforo P39, avrà la sigla: M31-290TPE6-GR b) vedi nota pag. 9 c) valore tipico misurato al centro dello schermo col metodo shrinking raster a 100 μA a) Δ = indicates the panel anti-reflection characteristics: E = etched (JEDEC 66/A) F = fine etched panel C = coated panel ○ = indicates the panel glass transmission: 3 = 31 % glass transmission 6 = 61 % glass transmission 9 = 92 % glass transmission .. = indicate the phosphor type (see page 10) Example: the type of a 12" monitor tube, neck 28,6 mm., 90° deflection angle, T-band implosion protection with etched panel 61% glass transmission and phosphor P39 will be: M31-290TPE6-GR. b) see note page 9 c) typical value measured at screen center with shrinking raster method at 100 μA
	M23-290T-..	90°	28,6	T-band	B7-208	Fig. 2	53	140 x 183	6,3	300	15	300	0 / 400	0,21 (c)	
10"	M24-190T-..	90°	20,0	T-band	E7-91	Fig. 3	53	149 x 198	11,0	70	12	400	0 / 350	0,22 (c)	
	M24-190PΔ○-..	90°	20,0	Panel	E7-91	Fig. 3	53 (b)	149 x 198	11,0	70	12	400	0 / 350	0,22 (c)	
	M24-192TPΔ○-..	90°	20,0	T-band + panel	E7-91	Fig. 4	53 (b)	149 x 198	11,0	70	12	400	0 / 350	0,22 (c)	
12"	M24-290T-..	90°	28,6	T-band	B7-208	Fig. 5	53	149 x 198	6,3	300	15	300	0 / 400	0,18 (c)	
	M24-290PΔ○-..	90°	28,6	Panel	B7-208	Fig. 5	53 (b)	149 x 198	6,3	300	15	300	0 / 400	0,18 (c)	
	M31-110T-..	110°	20,0	T-band	E7-91	Fig. 6	49	195 x 257	11,0	70	12	400	0 / 350	0,16 (c)	
	M31-110TPΔ○-..	110°	20,0	T-band + panel	E7-91	Fig. 6	49 (b)	195 x 257	11,0	70	12	400	0 / 350	0,16 (c)	
	M31-190T-..	90°	20,0	T-band	E7-91	Fig. 7	49	195 x 257	11,0	70	12	400	0 / 350	0,24 (c)	
	M31-190TPΔ○-..	90°	20,0	T-band + panel	E7-91	Fig. 7	49 (b)	195 x 257	11,0	70	12	400	0 / 350	0,24 (c)	
15"	M31-210T-..	110°	28,6	T-band	B7-208	Fig. 8	49	195 x 257	6,3	300	15	300	0 / 400	0,15 (c)	
	M31-210TPΔ○-..	110°	28,6	T-band + panel	B7-208	Fig. 8	49 (b)	195 x 257	6,3	300	15	300	0 / 400	0,15 (c)	
	M31-290T-..	90°	28,6	T-band	B7-208	Fig. 9	49	195 x 257	6,3	300	15	300	0 / 400	0,24 (c)	
	M31-290TPΔ○-..	90°	28,6	T-band + panel	B7-208	Fig. 9	49 (b)	195 x 257	6,3	300	15	300	0 / 400	0,24 (c)	
17"	M37-110T-..	110°	20,0	T-band	E7-91	Fig. 10	49	216 x 288	11,0	70	12	400	0 / 350	0,25 (c)	
	M38-210T-..	110°	28,6	T-band	B7-208	Fig. 11	49	226 x 291	6,3	300	15	300	0 / 400	0,21 (c)	
	M38-210TPΔ○-..	110°	28,6	T-band + panel	B7-208	Fig. 11	49 (b)	226 x 291	6,3	300	15	300	0 / 400	0,21 (c)	
	M38-210R-..	110°	28,6	Rimband	B7-208	Fig. 12	49	226 x 291	6,3	300	15	300	0 / 400	0,21 (c)	
	M38-210RPΔ○-..	110°	28,6	Rimband + panel	B7-208	Fig. 12	49 (b)	226 x 291	6,3	300	15	300	0 / 400	0,21 (c)	
	M38-290R-..	90°	28,6	Rimband	B7-208	Fig. 13	49	229 x 308	6,3	300	16	400	0 / 400	0,25 (c)	
	M38-290RPΔ○-..	90°	28,6	Rimband + panel	B7-208	Fig. 13	49 (b)	229 x 308	6,3	300	16	400	0 / 400	0,25 (c)	
	M38-370R-..	70°	36,5	Rimband	B12-246	Fig. 14	49	226 x 291	6,3	450	18	450	0 / 400	0,20 (c)	
	M38-370RPΔ○-..	70°	36,5	Rimband + panel	B12-246	Fig. 14	49 (b)	226 x 291	6,3	450	18	450	0 / 400	0,20 (c)	
	M38-390R-..	90°	36,5	Rimband	B12-246	Fig. 15	49	226 x 291	6,3	450	18	450	0 / 400	0,18 (c)	
M38-390RPΔ○-..	90°	36,5	Rimband + panel	B12-246	Fig. 15	49 (b)	226 x 291	6,3	450	18	450	0 / 400	0,18 (c)		
20"	M44-110T-..	110°	20,0	T-band	E7-91	Fig. 16	48	269 x 346	11,0	70	14	400	0 / 350	0,25 (c)	
	M44-210T-..	114°	28,6	T-band	B7-208	Fig. 17	46	269 x 346	6,3	300	18	300	0 / 400	0,23 (c)	
	M44-210TPΔ○-..	114°	28,6	T-band + panel	B7-208	Fig. 17	46 (b)	269 x 346	6,3	300	18	300	0 / 400	0,23 (c)	
24"	M50-110M-..	114°	20,0	Metal frame	E7-91	Fig. 18	44	308 x 393	11,0	70	14	400	0 / 350	0,30 (c)	
	M50-210M-..	114°	28,6	Metal frame	B7-208	Fig. 19	44	308 x 393	6,3	300	18	300	0 / 400	0,27 (c)	
	M50-210MPΔ○-..	114°	28,6	Metal frame + panel	B7-208	Fig. 19	44 (b)	308 x 393	6,3	300	18	300	0 / 400	0,27 (c)	
24"	M61-210M-..	110°	28,6	Metal frame	B7-208	Fig. 20	42	375 x 481	6,3	300	18	300	0 / 400	0,30 (c)	
	M61-210MPΔ○-..	110°	28,6	Metal frame + panel	B7-208	Fig. 20	42 (b)	375 x 481	6,3	300	18	300	0 / 400	0,30 (c)	



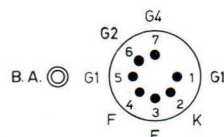
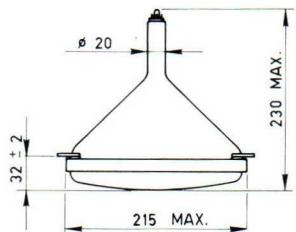
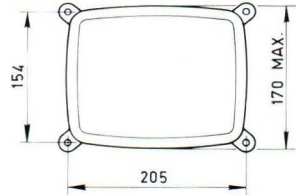
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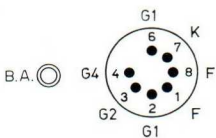
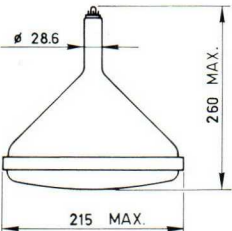
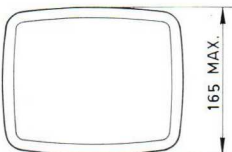
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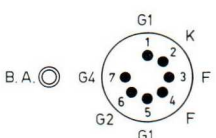
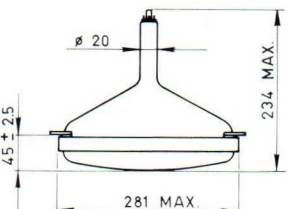
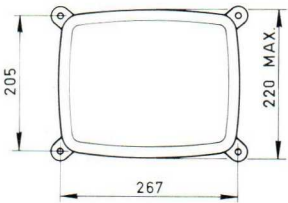
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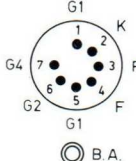
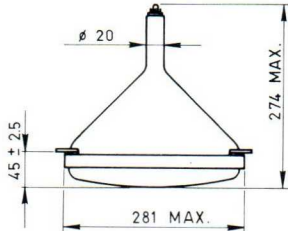
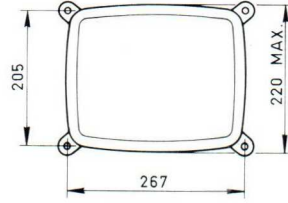
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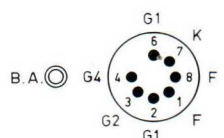
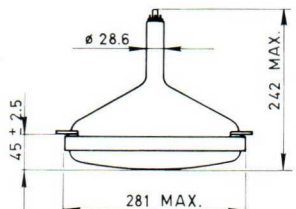
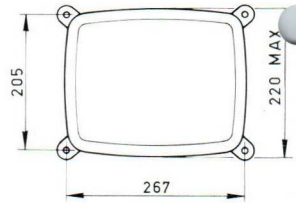
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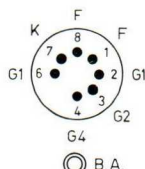
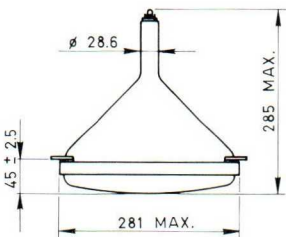
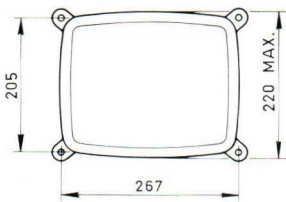
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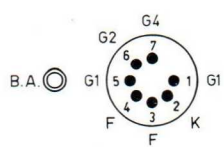
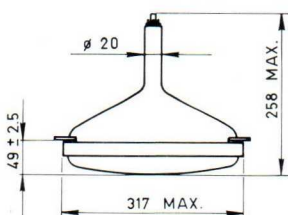
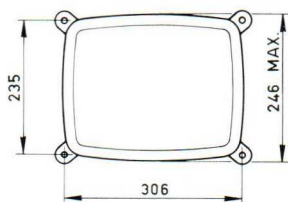
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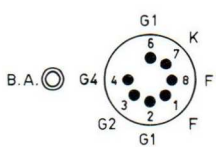
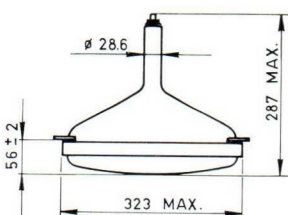
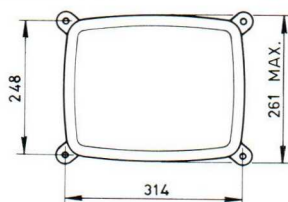
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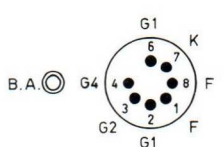
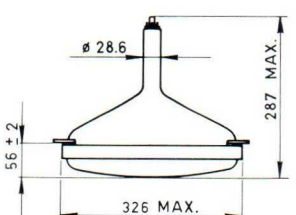
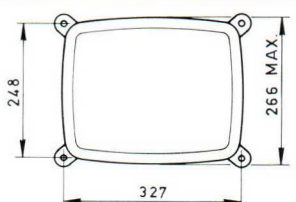
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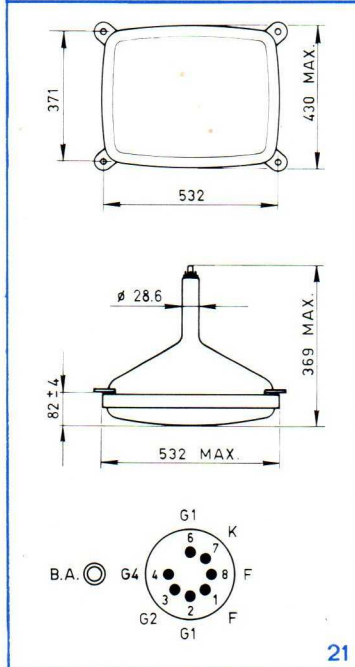
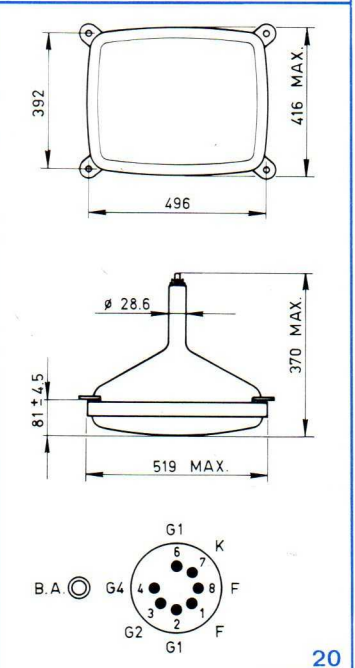
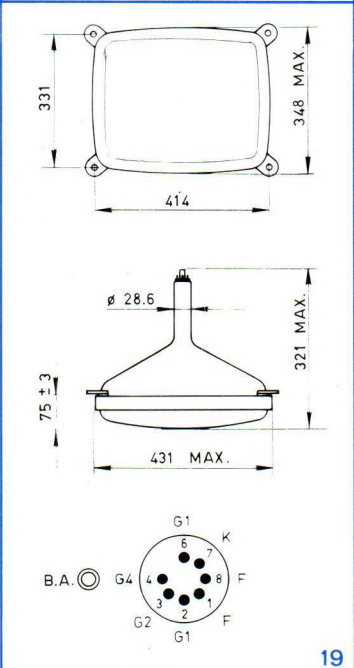
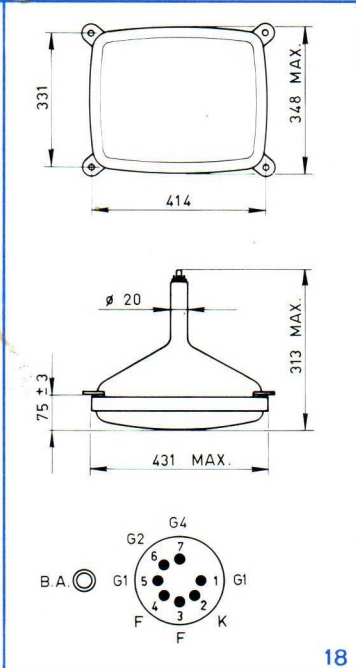
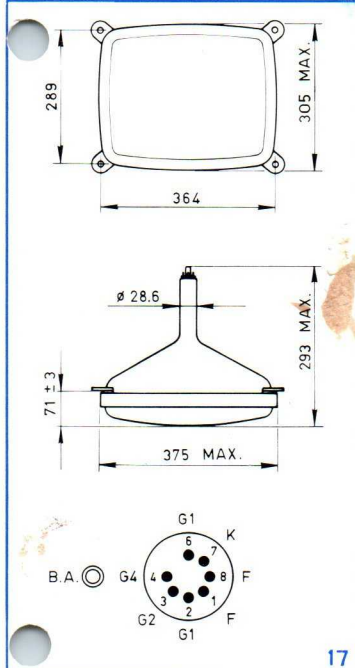
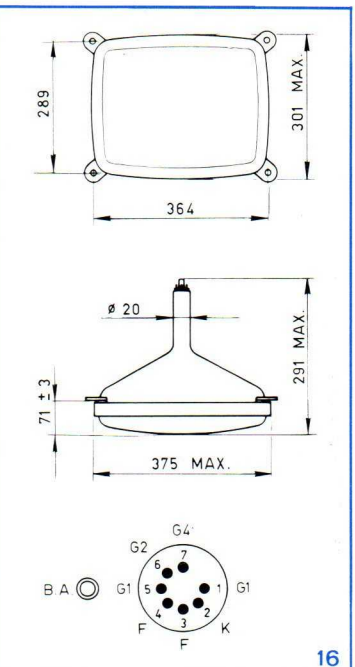
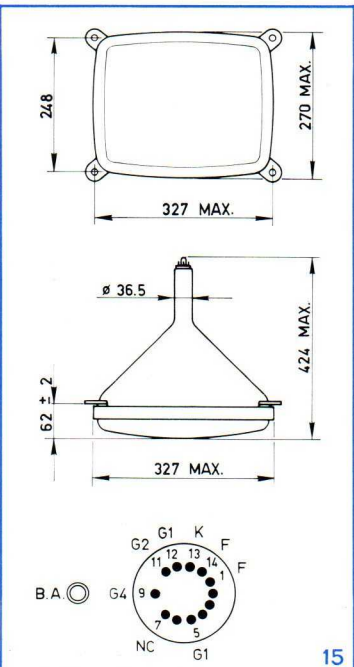
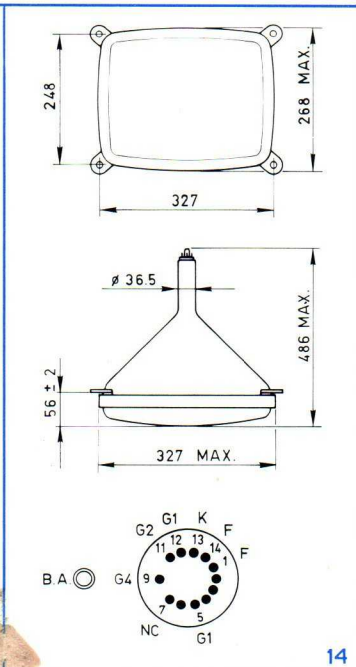
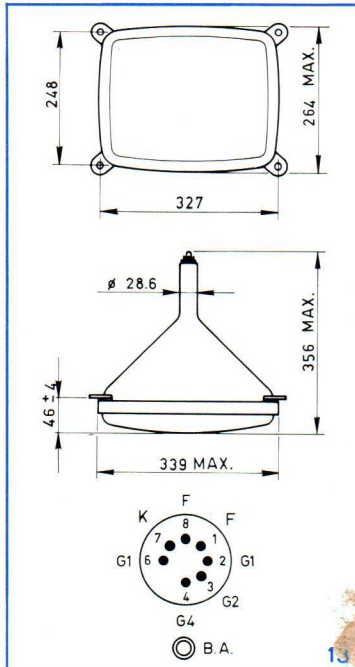
10



11



12



b) - Possono essere applicati pannelli con trasparenza nominale del 31 - 61 o 92 % con trattamento antiriflettente. In tali casi il valore di trasparenza totale dello schermo sarà quello indicato in tabella moltiplicato rispettivamente per 0,31 - 0,61 o 0,92.

I valori di risoluzione pubblicati a pag. 7 si riferiscono a CRT utilizzando pannelli con trattamento antiriflettente per deposizione.

Se vengono utilizzati pannelli con trattamento antiriflettente per corrosione, detti valori vanno moltiplicati per 1,25.

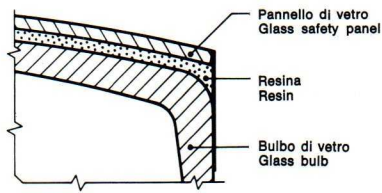
L'applicazione del pannello aumenta di circa 5 mm. l'altezza riportata nelle dimensioni d'ingombro.

b) - Safety panels can be applied with coated or etched surfaces and nominal glass transmission of 31, 61 or 92 %. In order to obtain the total screen transmission it is necessary to multiply the nominal screen glass transmission (stated on page 6) by 0,31 - 0,61 or 0,92.

The values of resolution listed at page 7 refer to CRTS using antiglare coated panels.

If antiglare etched panels are used, them said values must be multiplied by 1.25.

With the panel the tube height is increased by approximately 5 mm.



CARATTERISTICHE DEI FOSFORI

PHOSPHOR SCREEN CHARACTERISTICS

Sigla EIA EIA Type	Sigla Europea European Type	Fluorescenza Fluorescence	Fosforescenza Phosphorescence	Persistenza Persistence	Uso tipico Typical use
P 1	G J	giallo - verde yellowish - green	giallo - verde yellowish - green	media medium	Oscillographs and radars
P 2	G L	giallo - verde yellowish - green	giallo - verde yellowish - green	medio - breve medium - short	Oscillographs
P 4	W	bianco white	bianco white	medio - breve medium - short	Direct view television
P 7	G M	bianco white	giallo - verde yellowish - green	lunga (giallo - verde) long (yellowish - green) medio - breve (blu - porpora) medium-short (purplish-blue)	Radar & Oscillography
P 11	B E	blu blue	blu blue	lunga long	Photographic applications
P 16	A A	violetto violet	violetto violet	molto breve very short	Flying spot scanning
P 19	—	arancio orange	arancio orange	lunga long	Radar
P 24	G E	verde green	verde green	breve short	Flying spot scanning
P 28	—	giallo - verde yellowish - green	giallo - verde yellowish - green	lunga long	Radar
P 31	G H	verde green	verde green	medio - breve medium - short	General oscillography and photography
P 32	G B	blu - porpora purplish - blue	giallo - verde yellowish - green	molto lunga very long	Radar
P 33	L D	arancio orange	arancio orange	molto lunga very long	Radar
P 39	G R	giallo - verde yellowish - green	giallo - verde yellowish - green	lunga long	Information display
P 42	G W	giallo - verde yellowish - green	giallo - verde yellowish - green	media medium	Data display
P 45	—	bianco white	bianco white	media medium	Visual display

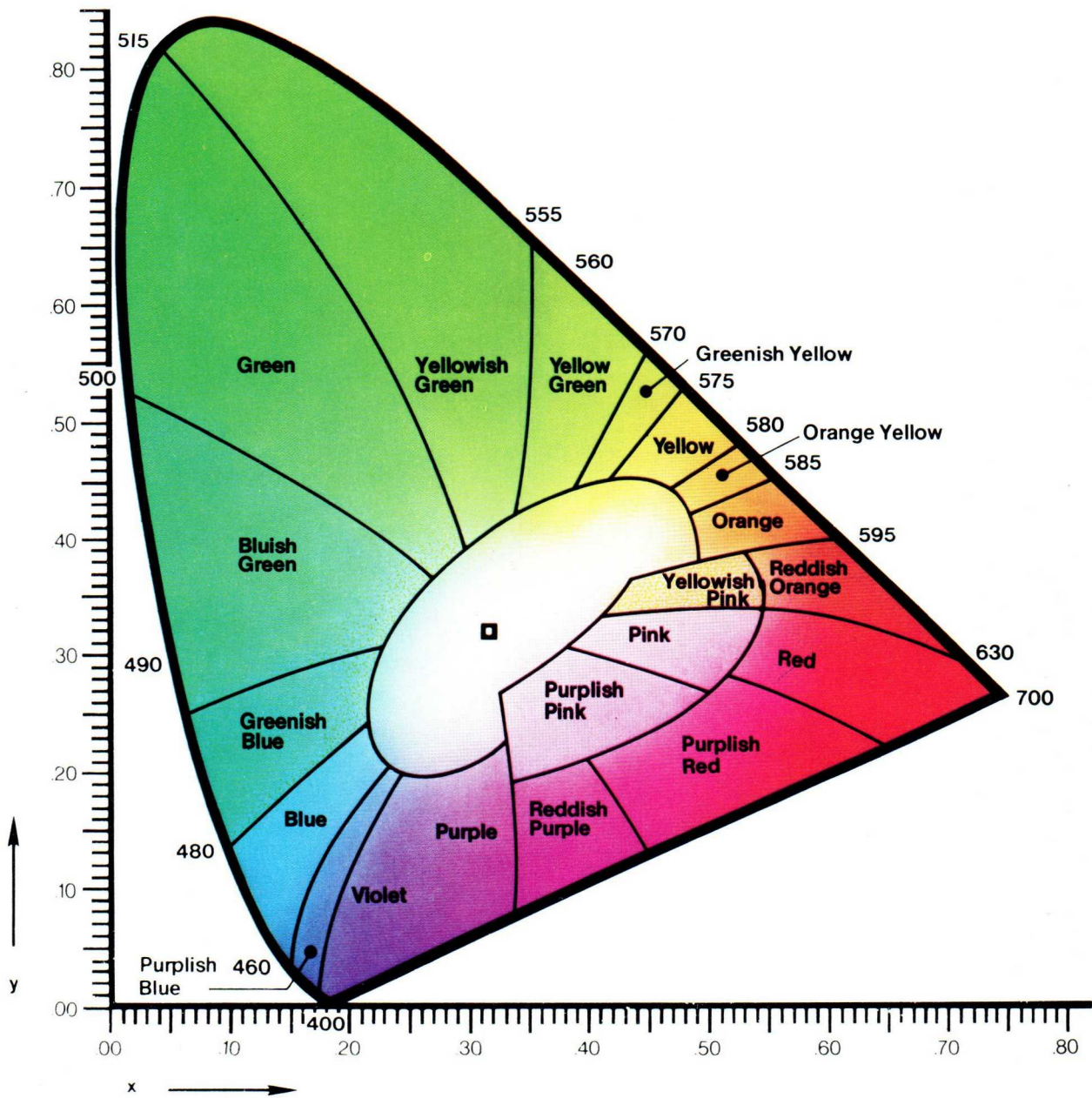
Possono essere impiegati altri tipi di fosfori su richiesta specifica del cliente.
Other phosphors can be used on request.

CLASSIFICAZIONE DELLA PERSISTENZA • PERSISTENCE CLASSIFICATION

molto lunga very long	= > 1 sec.	media - breve medium - short	= 1 msec. ÷ 10 µsec.
lunga long	= 1 sec. ÷ 100 msec.	breve short	= 10 µsec. ÷ 1 µsec.
media medium	= 100 msec. ÷ 1 msec.	molto breve very short	= < 1 µsec.

DIAGRAMMA DI CROMATICITÀ C.I.E.

C.I.E. COLOR DESIGNATION CHART



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