INSTRUCTION MANUAL

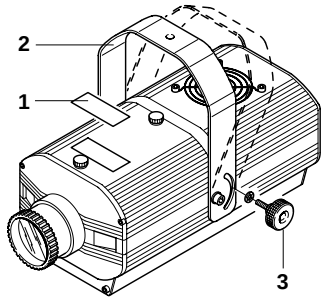
IMPORTANT: Read carefully. It is essential for the correct and safe use of the equipment that erectors and operators should be fully conversant with the information and instructions given in this manual.

1 INSTALLING THE PROJECTOR

• Unpacking

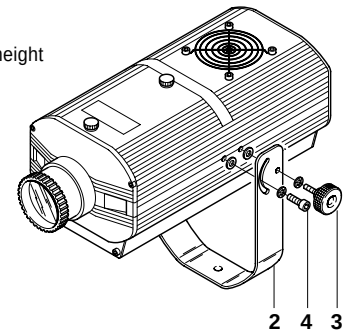
Open the box, remove the projector from the packing and place it on a flat horizontal surface.
Unpack the standard accessories supplied with the equipment. Inspect the lamp change label (**1**) and replace with one of the optional language versions if necessary.

Make certain that the label is never removed, as it displays important safety information.



• Initial assembly operations

Position the bracket (**2**) the desired height and secure by tightening the knobs (**3**). The bracket can also be freed by removing the screws (**4**) and the knobs (**3**), and refitted from the underside of the projector.



• Fitting the lamp

Refer to directions for replacement of the lamp given under heading 6 MAINTENANCE.

• Installing the projector

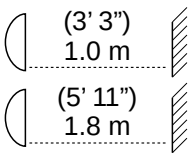
The projector can be mounted in any position without its operating characteristics being affected.

IMPORTANT: *fix the projector in the desired position utilizing the holes in the bracket (**2**). Secure preferably using two ø10 bolts with nuts and lock washers.*

Make certain that the anchorage is stable before positioning the projector.

• Minimum distance from target objects

The projector must be positioned in such a way that objects struck by the beam are separated from the lens at least by the distance indicated on the lamp change label next to the symbol illustrated alongside.



HTI 300
HMD 300

HMI 575

• Minimum distance of inflammable materials from any part of the equipment:
0.05 m (2') for HTI 300 and HMD 300, and 0.07 m (3') for HMI 575.

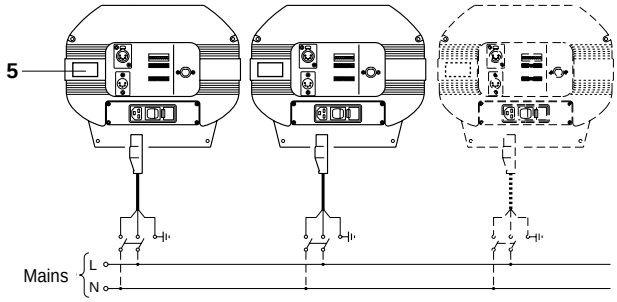
F **The appliance may be mounted on surfaces rated normally inflammable.**

IMPORTANT: *For better and more reliable operation of the projector, the ambient temperature must not exceed 35° C (95° F). Protection factor IP 20: the appliance is protected against penetration of solid bodies more than 12mm (0.5") in diameter (first digit 2), but can be damaged by spray, jet, drip or rain water (second digit 0).*

2 POWER SUPPLY AND INTERFACE

• Connecting to the electrical power supply

The operations described in this heading must be carried out by a licensed electrician.
The projector must be wired up to the electrical power supply using the special socket connector provided. It is good policy to connect projectors to the power supply by way of dedicated switches, so that each can be turned on and off individually from a remote station.

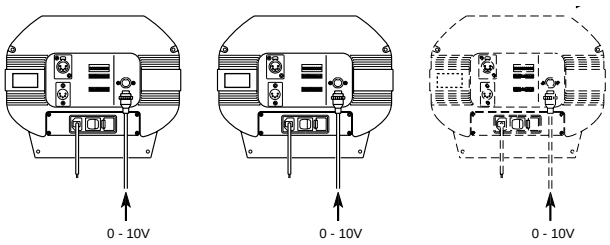


The projector is designed to operate at the voltage and frequency indicated on the electrical data plate (**5**) affixed to the rear end.
Check that these two values correspond to the mains voltage and frequency.

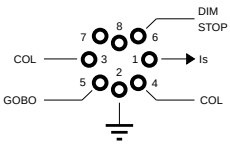
IMPORTANT: the projector must be connected to a power supply circuit having a proper earth system (Class I appliance).

• Connecting the control signals

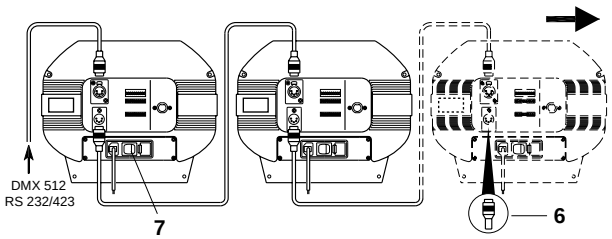
0 -10V CONNECTION



The connection between controller and projector must be made using a multicore cable with 8 wires of 0.25mm² section and a DIN 8 PIN 45° plug/socket connector



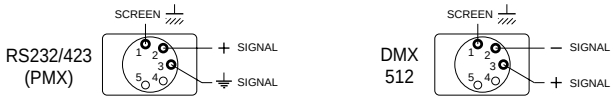
RS 232/423(PMX) - DMX 512 CONNECTION



Projectors are wired up to the controller and one to the next using two-core screened cable and Cannon 5 pin XLR type plug/socket connectors.

To connect a DMX line, a terminating plug (**6**) with a 100Ω resistor wired between pins 2 and 3 must be fitted to the last projector connected in series; the plug is not required when using a RS232/423(PMX) signal.

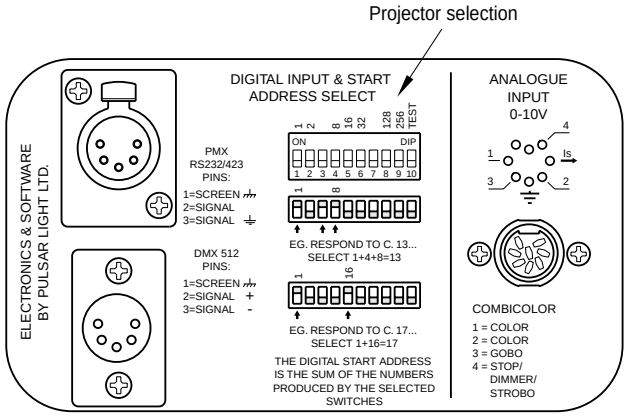
The wires must not come into contact with each other or with the metal casing of the plug. The casing of the plug/socket must be connected to the screen and to pin 1 of the connectors.



Having completed the operations described above, press the on/off switch (**7**). Check that the warning light comes on and that the auto-reset sequence starts.

• Projector address codes (for digital signals)

A single COMBICOLOR utilizes 4 control channels. To ensure that the different projectors are addressed correctly by the controller, a code must be assigned to each one. The operation is carried out on each COMBICOLOR by setting the dip-switches as indicated in the table below.



CODE		1	2	4	8	16	32	64	128	256	TEST
Projector 1 - Channels 1-4	ON	▲									
	OFF		▽	▽	▽	▽	▽	▽	▽	▽	▽
Projector 2 - Channels 5-8	ON	▲		▲							
	OFF		▽		▽	▽	▽	▽	▽	▽	▽
Projector 3 - Channels 9-12	ON	▲			▲						
	OFF		▽	▽		▽	▽	▽	▽	▽	▽
Projector 4 - Channels 13-16	ON	▲		▲	▲						
	OFF		▽			▽	▽	▽	▽	▽	▽
Projector 5 - Channels 17-20	ON	▲				▲					
	OFF		▽	▽	▽		▽	▽	▽	▽	▽
Projector 6 - Channels 21-24	ON	▲		▲		▲					
	OFF		▽		▽		▽	▽	▽	▽	▽
Projector 7 - Channels 25-28	ON	▲			▲	▲					
	OFF		▽	▽			▽	▽	▽	▽	▽
Projector 8 - Channels 29-32	ON	▲		▲	▲	▲					
	OFF		▽				▽	▽	▽	▽	▽
Projector 9 - Channels 33-36	ON	▲					▲				
	OFF		▽	▽	▽	▽		▽	▽	▽	▽
Projector 10 - Channels 37-40	ON	▲	▲		▲		▲				
	OFF		▽	▽		▽		▽	▽	▽	▽
	ON										▲
	OFF										▽

Setting the TEST switch to the ON position for a few seconds with the projector powered-up, an auto-reset routine is carried out. Leaving the TEST switch at the ON position for a longer period, a full self-test program will be completed; once the operation has terminated, return the switch to the OFF position.

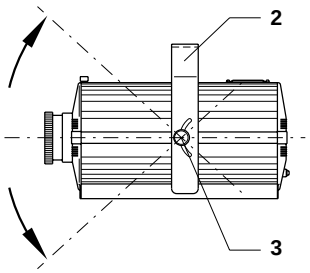
3 POSITIONING THE PROJECTOR

Before positioning the projector, set the channels as shown in the following table.

CHANNEL	POSITION OF SLIDER
1 COLOUR WHEEL 1	0% (white beam)
2 COLOUR WHEEL 2	0% (white beam)
3 GOBO SELECTION	-
4 DIMMER/STOPPER-STROBE	100% (white beam)

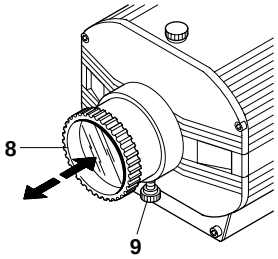
• Aligning the beam

Having completed all the operations indicated thus far, loosen the knobs (**3**), manoeuvre the projector on the bracket (**2**) until the beam is directed at centre stage, then retighten the knobs (**3**).



• Adjusting the lens

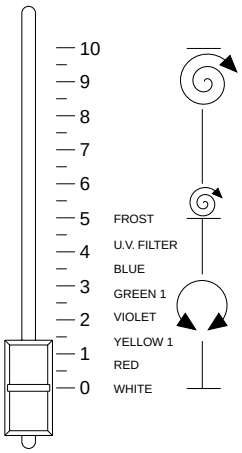
Move the lens (**8**) back and forward until the projected image is satisfactorily focused, then tighten the knob(**9**).



4 CHANNEL FUNCTIONS

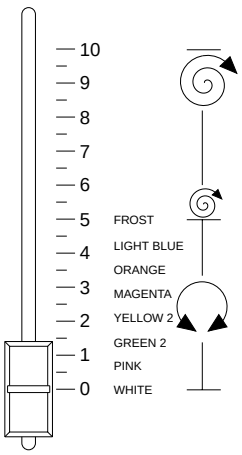
CHANNEL	FUNCTION
1	COLOUR WHEEL 1
2	COLOUR WHEEL 2
3	GOBO SELECTION
4	DIMMER/STOPPER-STROBE

• COLOUR WHEEL 1 - channel 1



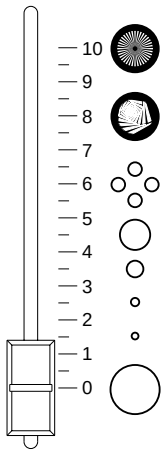
In the 0% to 50% range of adjustment, the change of colour in response to the movement of the potentiometer is linear and continuous, so that the slider can be stopped in intermediate positions to obtain a two colour beam.
From 50% to 100% the wheel rotates continuously with speed increasing steadily from 0 to 300 rpm.

• COLOUR WHEEL 2 - channel 2



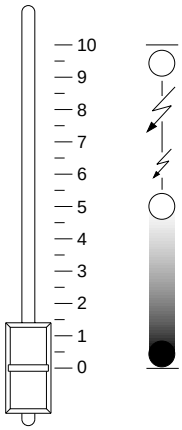
In the 0% to 50% range of adjustment, the change of colour in response to the movement of the potentiometer is linear and continuous, so that the slider can be stopped in intermediate positions to obtain a two colour beam.
From 50% to 100% the wheel rotates continuously with speed increasing steadily from 0 to 300 rpm.

• GOBO SELECTION - channel 3



The change occurs instantaneously as the slider reaches different preset levels on the graduated scale. Between 95% and 100% in the range of adjustment, the gobo changes automatically every 15 seconds.

• DIMMER/STOPPER-STROBE - channel 4



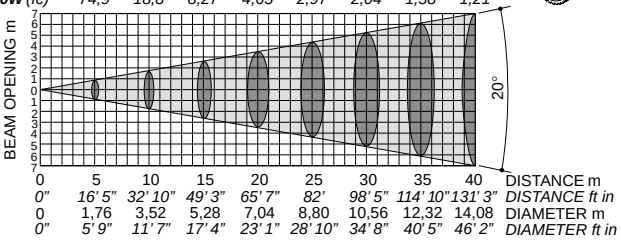
In the 0% to 50% range of adjustment, the dimmer opens gradually to maximum aperture.
Strobe effect is produced from 55% to 95%, with frequency increasing from 1 to 11 flashes per second.
The aperture remains fixed between 95% and 100% of the range.

5 LENS UNITS

GRAPHS SHOWING BEAM DATA AND ILLUMINATION VALUES

Objective lens 1:2,2/100 - *Standard equipment*

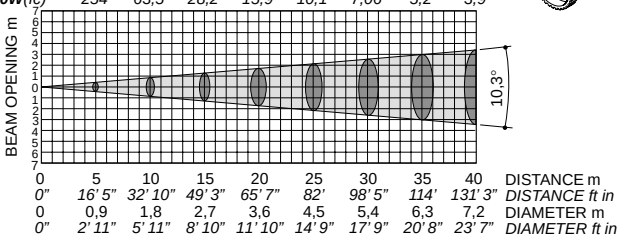
HMI 575W	(lux)	2.320	580	258	145	93	64	47	36
HMI 575W	*(fc)*	*216*	*53,9*	*24*	*13,5*	*8,64*	*5,95*	*4,37*	*3,34*
HTI 300W	(lux)	1.120	280	124	70	45	31	23	18
HTI 300W	*(fc)*	*104*	*26*	*11,5*	*6,5*	*4,18*	*2,88*	*2,14*	*1,67*
HMD 300W	(lux)	806	202	89	50	32	22	17	13
HMD 300W	*(fc)*	*74,9*	*18,8*	*8,27*	*4,65*	*2,97*	*2,04*	*1,58*	*1,21*



0	5	10	15	20	25	30	35	40	DISTANCE m
0"	*16' 5"*	*32' 10"*	*49' 3"*	*65' 7"*	*82'*	*98' 5"*	*114' 10"*	*131' 3"*	*DISTANCE ft in*
0	1,76	3,52	5,28	7,04	8,80	10,56	12,32	14,08	DIAMETER m
0"	*5' 9"*	*11' 7"*	*17' 4"*	*23' 1"*	*28' 10"*	*34' 8"*	*40' 5"*	*46' 2"*	*DIAMETER ft in*

Objective lens 1:1,9/190 - *Available on request*

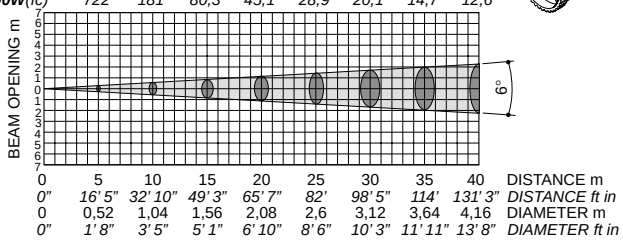
HMI 575W	(lux)	8.200	2.050	911	513	328	228	167	128
HMI 575W	*(fc)*	*762*	*190*	*84,6*	*47,7*	*30,5*	*21,2*	*15,5*	*11,9*
HTI 300W	(lux)	3.800	950	422	238	152	106	78	59
HTI 300W	*(fc)*	*353*	*88,3*	*39,2*	*22,1*	*14,1*	*9,85*	*7,25*	*5,48*
HMD 300W	(lux)	2.736	684	304	171	109	76	56	42
HMD 300W	*(fc)*	*254*	*63,5*	*28,2*	*15,9*	*10,1*	*7,06*	*5,2*	*3,9*



0	5	10	15	20	25	30	35	40	DISTANCE m
0"	*16' 5"*	*32' 10"*	*49' 3"*	*65' 7"*	*82'*	*98' 5"*	*114'*	*131' 3"*	*DISTANCE ft in*
0	0,9	1,8	2,7	3,6	4,5	5,4	6,3	7,2	DIAMETER m
0"	*2' 11"*	*5' 11"*	*8' 10"*	*11' 10"*	*14' 9"*	*17' 9"*	*20' 8"*	*23' 7"*	*DIAMETER ft in*

Objective lens 1:3,3/300 - *Available on request*

HMI 575W	(lux)	22.000	5.500	2.444	1375	880	611	449	344
HMI 575W	*(fc)*	*2.044*	*511*	*227*	*128*	*81,8*	*56,8*	*41,7*	*32*
HTI 300W	(lux)	10.800	2.700	1.200	675	432	300	220	189
HTI 300W	*(fc)*	*1.003*	*251*	*111*	*62,7*	*40,1*	*27,9*	*20,4*	*17,6*
HMD 300W	(lux)	7.776	1.944	864	486	311	216	158	136
HMD 300W	*(fc)*	*722*	*181*	*80,3*	*45,1*	*28,9*	*20,1*	*14,7*	*12,6*



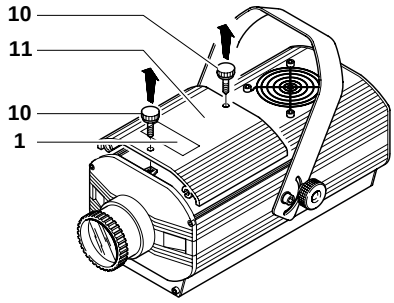
0	5	10	15	20	25	30	35	40	DISTANCE m
0"	*16' 5"*	*32' 10"*	*49' 3"*	*65' 7"*	*82'*	*98' 5"*	*114'*	*131' 3"*	*DISTANCE ft in*
0	0,52	1,04	1,56	2,08	2,6	3,12	3,64	4,16	DIAMETER m
0"	*1' 8"*	*3' 5"*	*5' 1"*	*6' 10"*	*8' 6"*	*10' 3"*	*11' 11"*	*13' 8"*	*DIAMETER ft in*

6 MAINTENANCE

IMPORTANT: *isolate the projector from the electrical power supply before commencing maintenance work of any description.*
*The maximum temperature on the outer surface of the projector under normal operating conditions is indicated on the lamp change label (**1**).*
*After switching off, do not remove any part of the projector for at least 10 minutes, as indicated on the lamp change label (**1**). Once this time has elapsed, the risk of a lamp exploding is practically zero. If the lamp needs changing, wait a further 15 minutes to avoid the risk of burns. In the event of a lamp exploding, the appliance is designed to prevent fragments of glass from being scattered.*
Lenses and clear filters supplied with the appliance must be fitted at all times, and if visibly damaged must be replaced promptly with genuine spares.

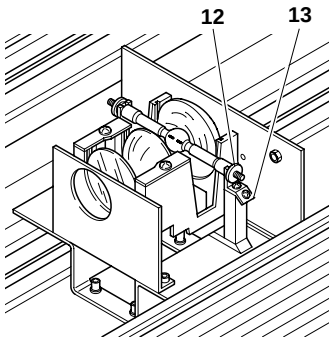
• Opening the projector

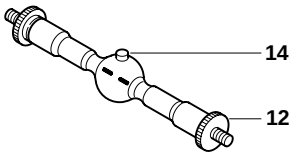
Free the access cover (**11**) by loosening the knobs (**10**), and remove from the projector.
Once the necessary work has been completed, refit the cover (**11**) and retighten the knobs (**10**).



• Changing the lamp

Open the projector, loosen the two side nuts (**12**) of the lamp to be changed and remove it from the supports (**13**).
Remove the new lamp from its packaging, loosen the two side nuts (**12**) and locate the lamp in the supports (**13**). Finally, retighten the nuts.





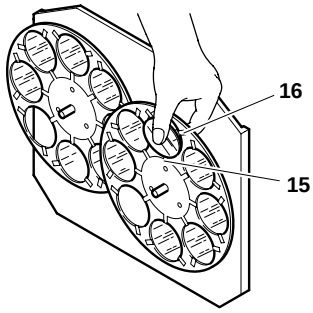
IMPORTANT: *for uniform distribution of the light beam, the lamp must be positioned so that the glass pip (**14**), on the bulb does not coincide with the optical axis of the projector. With this in mind, locate the pip as high up as possible.*

CAUTION: The projector uses a high pressure discharge lamp with external starter.

- ***When fitting a new lamp, read the manufacturer's instructions carefully.***
- ***The lamp must always be changed without delay if damaged or deformed by heat.***

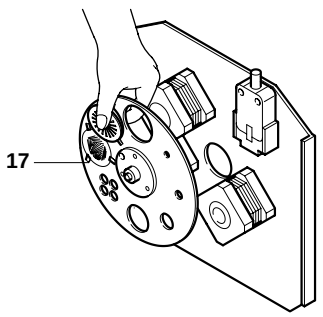
• Changing colour filters

Having opened the projector, identify the filter to be changed, grip firmly between thumb and forefinger and push against the spring clip (**15**) until free of the fixed clips (**16**). Bend the filter outwards and remove. Offer the new filter to the spring clip (**15**) and anchor behind the fixed clips (**16**).



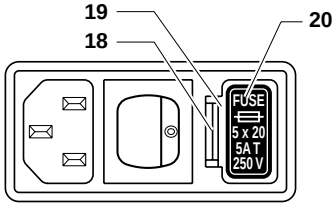
• Changing metal gobos

Having opened the projector, identify the gobo to be replaced and push gently toward the clips (**17**) until free.
Offer the new gobo to the first two clips, push gently and locate behind the remaining clips, checking for flatness.



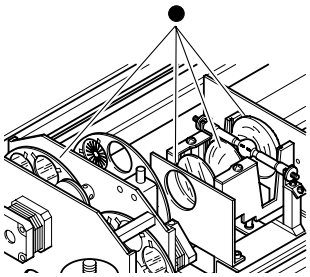
• Changing fuses

To change the fuses, press the tab (**18**) and pull out the fuse holder (**19**). Replace any blown fuse with one of the same type and rating as indicated on the label (**20**) attached to the holder (**19**). Insert the fuse holder and push in to engage the tab (**18**).



• Routine cleaning

To maintain the light output of the projector undiminished, parts that tend to accumulate dust and grease must be cleaned periodically.
In most circumstances, the projector will give long and trouble-free service if these simple guidelines are followed.
To remove dirt from the lenses and filters, use a soft cloth moistened with any liquid detergent suitable for cleaning glass.

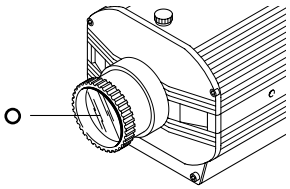


IMPORTANT: *do not use solvents or alcohol*

O Parts that need cleaning frequently.

● Parts that need cleaning monthly.

Internal components should also be given a general clean once a year, dislodging dust and dirt with a brush and removing it simultaneously with a vacuum cleaner.



7 TROUBLESHOOTING

PROJECTOR DOES NOT LIGHT UP / ELECTRONICS NOT WORKING / PROJECTION FAULTY / REDUCED BRIGHTNESS				***FAULTS***	
				POSSIBLE CAUSES	***CHECKS AND REMEDIES***
●				No electrical power supply.	Check that power is available at the mains socket and/or that fuses are intact.
●			●	Lamp expended or faulty.	Change lamp (see instructions).
	●			Signal transmission cable short-circuiting or disconnected.	Change cables.
	●			Address codes incorrect.	See projector coding instructions.
	●			Defect in electronic circuits.	Contact an authorized technician.
		●		Lenses broken.	Contact an authorized technician.
		●	●	Deposit of dust or grease.	Clean (see instructions).

8 TECHNICAL DATA

ELECTRICAL/MECHANICAL SPECIFICATIONS

Power supply

- HTI 300-HMD 300 version:
  - 220-240V 50Hz
  - 200V 50Hz - 230V 60Hz
  - 200V 60Hz
- HMI 575 version:
  - 220-240V 50Hz
  - 200-220V 60Hz

Lamp

Metal iodide type with special built-in power supply unit.

- Type of lamp: HTI 300W
  - Cap Sfc 10-4
  - Colour temperature 6,500 K
  - Luminous flux 22,000 lumen
  - Average life 750 h
- Type of lamp: HMD 300W
  - Cap Sfc 10-4
  - Colour temperature 5,700 K
  - Luminous flux 20,000 lumen
  - Average life 3,000 h
- Type of lamp: HMI 575W
  - Cap Sfc 10-4
  - Colour temperature 6,000 K
  - Luminous flux 49,000 lumen
  - Average life 750 h

Power consumption

- HTI 300-HMD 300 version
  - 800VA a 220V 50Hz (no correction)
- HMI 575 version
  - 750VA at 220V 50Hz
  - correction factor 70µF standard

Motors

N. 5 microstepping motors with full microprocessor control.

OPTICAL SYSTEM

Optical unit

- Main optical unit in diecast aluminium.
- Incorporating twin lens condenser.
- Reflector of high luminous efficiency.

Lens units

- Standard: 1:2,2/100 mm (20°).
- Optional:1:1,9/190 mm (10,3°).
- Optional:1:3,3/300 mm (6°).

CONTROL SYSTEMS

Channels

N. 4 control channels.

Inputs

The COMBICOLOR is set up to accept analog or digital signals from controllers or computers.

- Digital serial input: RS232/423(PMX) o DMX 512
- 0 -10V analog input

CONSTRUCTION FEATURES

Safety devices

- Power supply shuts off automatically in the event of overheating or cooling system failure.
- Power shuts off automatically when cover is opened.

Cooling

Forced ventilation cooling system using axial flow fans.

Housing

- Extruded die-cast aluminium.
- Epoxy powder coated finish.

Support

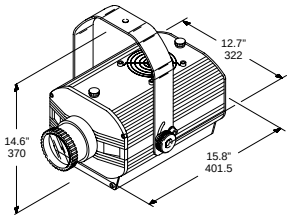
- Steel bracket with epoxy powder coated finish.
- Bracket adjustable through 110°.

Operating position

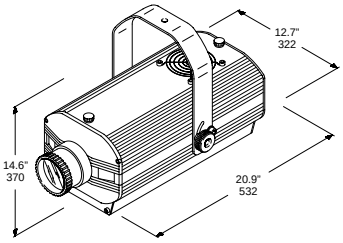
Will function in any position.

Weights and dimensions

- HTI 300-HMD 300: 14.3 kg. (31 lbs 70 oz)
- HMI 575: 20 kg. (44 lbs)



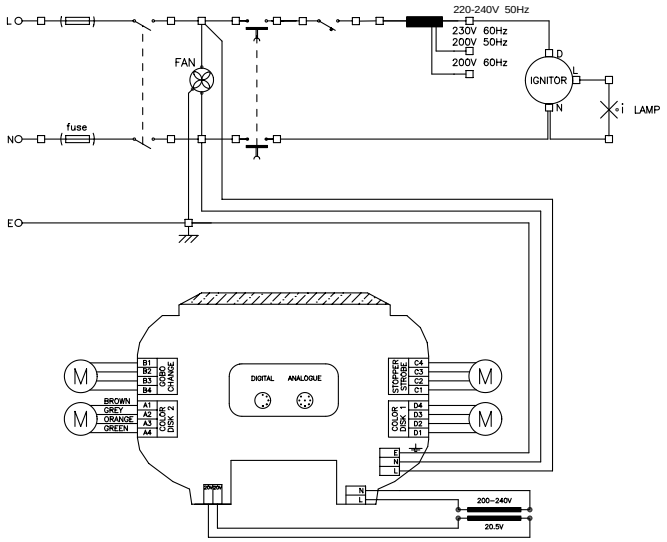
COMBICOLOR 300



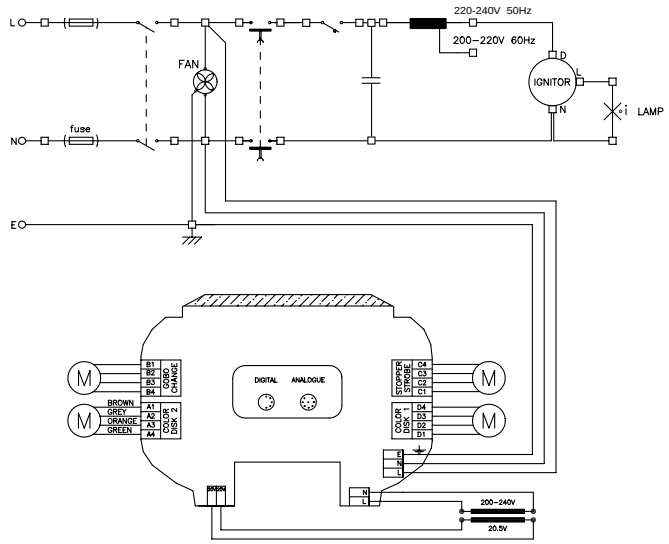
COMBICOLOR 575

9 WIRING DIAGRAM

HTI 300 - HMD 300



HMI 575



The specifications published in this manual are not binding, and may be revised or updated at any time by Clay Paky without notice in the interests of improving product quality.

The products referred to in this manual comply with EC Directives on:

• Low Voltage 73/23

• Electromagnetic Compatibility 89/336